An Address
ON
GUNSHOT WOUNDS OF THE HEAD.

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MR. PRESIDENT AND GENTLEMEN,—The subject of gunshot injuries of the head is, of course, an enormously wide one, and it includes not only the important question of how the actual injury to the brain is produced, but the subject can clinically also be profitably discussed from another point of view altogether—namely, causes of death and how to prevent them. I shall speak more in the former direction, and especially because I have not been permitted to see any cases in the present war except a few exceptional instances which happened to be referred to me unofficially.

PHYSICAL EFFECTS PRODUCED BY HIGH-VELOCITY BULLETS.

I made a large number of experiments[1] on this subject over twenty years ago when the 0·303 rifle was introduced into the services, and the results were fully confirmatory of those in part arrived at previously and independently on the Vetterli rifle by Professor Kocher, especially as to the so-called explosive effect of high-velocity projectiles. It occurred to me then that what was required was a registration method. To this end I employed modelling clay, a substance which roughly resembles the tissues in that it contains a considerable percentage of water in its interstices, but differs with advantage in that when disrupted it remains exactly as the explosive force had deformed it, so that all that was necessary was to fill the cavities produced by the bullet with plaster-of-Paris and thereby obtain an absolutely accurate record of the whole effect of the shot.

The method immediately showed several things: first, that the so-called explosive effect was directly proportional (1) to the sectional area of the bullet; (2) to its velocity; (3) to the amount of water present in the substance through which a bullet passes; and (4) that the forces of disruption were at an angle to the axis of the flight of the bullet which I have never been able to determine completely. I have obtained by means of the clay-plaster method further points concerning the ballistics of the projectile which could not be reached in any other way. The most practically important for our present subject are: (1) Where in the course of the bullet most mischief is done, and (2) by what force.

Point of Maximal Disturbance.

The casts show that the maximal disturbance is produced of course as soon as the bullet at its highest velocity is surrounded by the largest mass of wet tissue. In the animal the conditions are governed by other considerations, of which the most important is that the water-holding material is surrounded by an elastic skin, and that the so-called larger aperture of exit necessarily results from the driving out of the limb or trunk all the fragments of tissue, bone, and particles of fluid to which the velocity of the bullet has been communicated. The larger aperture of exit is a matter therefore of what happens to be struck in the interior of the skin envelope.

Forces Producing the Injury.

These relate to the two movements of a bullet—first, its progression forward, and secondly, its spin around a central axis given to it by the rifling. It is ordinarily assumed that the progression forward movement is the more important, but in my opinion it is not so, although, of course, the amount of injury naturally depends on the length of traverse of the body by the bullet. The most important movement from a pathological point of view, I suggest, is the rotatory spin; and I came to this opinion by observing, to my surprise, that the rotation of the bullet was still visible on the plaster cast even up to the moment when the bullet ceased to penetrate any more.

It is quite clear that under these circumstances the disruption of the tissues must be attributed in the main to the rotating forces of a bullet; and the transverse section of a plaster cast of the cavity made by a bullet fired into wet clay—in which, therefore, there is a maximum disruption due to the water—shows that the particles of fluid are thrown off practically at right angles to the axis of flight. It is interesting to notice also in some of the casts that these disruptive tears have very often a spiral direction antero-posteriorly, the turns of which are of the same length as the spirals of the grooves of the rifle. Sometimes these have also shown an interesting degree of direction backwards, and then the tear is circumferential to the axis of flight, which reminds one very forcibly of the compression waves of air shown in Professor Boys's beautiful photographs of a 0·303 bullet during its flight. It is clear that if the density of the clay varied suddenly, as it does not infrequently, the results would be a fixation in the plaster of the disruption wave quite comparable to that of the more labile fluid air as in Professor Boys's experiment.

Influence of Shape of Bullet.

We must now consider the question how far the shape of a bullet affects the question of degree of destruction. The so-called explosive bullet, or dum-dum, is a soft-nosed lead bullet which deforms very easily, and by its expansion greatly increases the sectional area. Very considerable confusion seems to have arisen recently because the modern jacketed rifle bullet has been made more and more pointed until there is a very great contrast between the long, sharp nose and the flat base. It has actually been supposed that this bullet makes a much worse wound if it advances through the tissues base foremost instead of the apex, whereas, of course, the result being proportional to the sectional area, it makes no difference.

This brings me to the next point, of which a good deal has been made on purely hypothetical grounds—namely, the question of the modern pointed bullet turning over during its passage through the tissues. Undoubtedly turning over of an elongated projectile is a very common event. To find out whether it was more common now with the modern-shaped bullet than with the old conical projectile I asked Mr. Daw, of Messrs. Hollands and Hollands, kindly to make for me some 0·22 calibre cartridges with

[1] Proceedings of the Royal Institution of Great Britain, 1895, vol. xiv., p. 228.

bullets of the same weight as the ordinary conical pattern, but pointed like the modern service projectile, and of course with the same load. This he very kindly did, and I show you the records of experiments made by the clay method under as nearly as possible similar conditions, the first being an imitation service bullet, the second the old conical pattern (both these being 0·22 calibre), and the third the larger 0·310 soft lead bullet to contrast with the service bullet, and to settle again the question of the deformity caused by the various projectiles respectively. This point, I may mention, I had already dealt with in my first experiments 20 years ago, and which, as I have already stated, went to show that the apex of a bullet had no bearing on the immediate question of amount of destruction. I have also dealt with it in a report furnished to Lord Kitchener and published by him.

Turning Over.

Some misconception as regards turning over has arisen, because it seems to be imagined that a very pointed bullet might turn over and over round a transverse axis through the middle of its length, progressing, in fact, like a wheel, but this is not the case, it only turns over once. Turning over is very common, but as is shown when the bullet enters clay or soap it does not happen until nearly half its course has been passed over—i.e., when the progressive velocity is greatly reduced and the advance of the bullet becomes more sensitive to obstructions which will first affect the light tip, the momentum of which is very different to that of the base. Further, in consequence no doubt of the greater obstruction and friction set up when the bullet travels at right angles to its long axis, its traverse of the tissues is much reduced, but the spin due to the rifling continues to the end.

As regards the disturbance of the tissues caused by turning over the net result is conversion of a tubular wound into a cleft which is nearly triangular in cross section, a narrow isosceles triangle, the base of which is caused by the base of the bullet and the apex by the point. When turning over has reached its complete development there is certainly rather more appearance of disruption, but on measuring the circumference of such a cast there is little difference between the "turned over" region with the immediately precursory cylindrical part of the bullet's course. The practical conclusion which follows from these facts is, of course, that turning over is not to be credited, as it has been, with doing much harm, the real cause of great destruction of tissue, &c., being, of course, the high velocity and rapid spin.

Fragments of Bone.

The clay-plaster method showed me another fact that I had not considered fully. It is that the deep penetration of the brain by a fragment of bone is in the first place the simple consequence of the high velocity of the bullet being communicated to such bodies much lighter than itself, and therefore capable of proceeding as far as and even farther than the shot. In view of the fact that any such fragment may be infected, it follows that at the first operation every reasonable search must be made for fragments as they certainly may later cause the death of the patient.

Dr. Bruce's beautiful radiogram is an interesting example because the shrapnel bullet, partly caught by the edge of the hole, nevertheless has sent on five fragments, one streaked with lead, deeply into the brain. This was the case of an officer who came under my care some ten days after he was wounded at the end of August. There was a foul small round wound above the left frontal eminence which Dr. Spitta found was infected with staphylococcus aureus, and it led into an abscess cavity about 2 inches deep. I removed the purulent débris, fragments, &c., cut away the original wound in skin and bone, and disinfected with sublimate lotion, hydrogen peroxide, and weak carbolic. Vaccination with autogenetic vaccines was carried out by Dr. Spitta for two months. The patient has made an excellent recovery; the cavity has after three months cicatrised, and he has returned fit for light duty. The distance of penetration of the bone fragments in this case is exaggerated, of course, by the retention of the shrapnel bullet on the inner edge of the hole.

CLINICAL FEATURES.

Perhaps the most important subdivision of clinical conditions which are special is that of causes of death.

1. *Concussion.*

Several cases have been reported of fatal concussion without penetration of the skull. These are, of course, perfectly possible because they fall into the same category as the deaths caused by the simple blow of a cricket ball. They are apparently due to direct paralysis of the respiratory and cardiac centres in the bulb. Mr. Walter Spencer and I showed many years ago that mere pressure on the unopen skull, if sufficiently severe on thin parts, could affect the intracranial tension so as to interfere with the functional activities of these centres.

2. *Rise of Intracranial Pressure.*

Duret showed many years ago that the most paralysing effects on the centres of organic life were produced most easily by force applied in what he called the fronto-bulbar axis, and he showed that the effect of shock applied to the frontal region was transmitted largely by the cerebro-spinal fluid to the interior of the ventricles, and even to the fourth ventricle. This is undoubtedly the first effect of a gunshot wound to the head, and evidenced by functional inhibition of the respiratory centre, as Kramer and myself showed first in 1897. Concurrently one has, of course, immediate hæmorrhage and therefore an equal immediate rise of intracranial pressure. If this is not relieved the embarrassed respiratory centre fails. At the same time the vagal centre is at first stimulated and causes very slow beats of heart, and as the pressure rises this gives place to paralysis of the vagal mechanism, and then begins the fatal and final stage. Probably a certain number of deaths in cases of this kind could be saved by immediate operation, and I have under my observation now an officer whose life was so preserved by Major Sherran, R.A.M.C., who, recognising the urgency of this condition just described, operated at the field dressing station within a very few minutes of the infliction of the wound by trephining and washing out the extravasated blood, thus releasing the pressure and saving the patient's life. The patient is now gradually recovering. In many cases if there is a good blood pressure the intracranial tension often prevents a rapid hæmorrhage.

3. *Sepsis.*

This is, of course, primarily and in the vast majority of cases due to incomplete disinfection of the original wound, but also to the fatal and detestable practice of "leaving head cases alone," which being the outcome of ignorance both of the functions of the brain and of the principles of antiseptic surgery, led many surgeons of the old school (some of whom apparently still survive) to leave a patient steadily to die rather than perform the duty of attempting to save him. I believe this wicked tradition was also in part created by the fact that the leucocytic barrier, whether subdural or intracerebral, was occasionally quite equal to fighting off the infection, and because such a neglected patient got well, the non-comprehending surgeon said, "Let us leave head cases alone as a rule!" It is to the credit of the British Army Medical Service that they showed in their observations and work during the South African War the falsity of this error. We may hope, therefore, that the example of the brilliant surgery of officers like Major Sherran will prevent cases arriving in England under conditions hopeless of restoration both of life and function.

One word in conclusion on general septic infection. Suppose the subdural space is infected and cerebro-spinal meningitis results. Are these cases necessarily fatal? Evidently they are not, as, indeed, Mygind had always contended. What is to be our routine? A case I saw with Dr. Fraser at Southampton, and which I hope he will publish, suggests that the course adopted in that instance might be generally tried—viz., free opening and disinfection by irrigation of the cranial subdural space at the seat of the injury, a liberal lumbar puncture (1½–2 ounces), repeated if improvment arrested, and autogenetic vaccine treatment. I understand that at Cambridge repeated lumbar puncture has been most efficacious in the treatment of the parallel condition of epidemic cerebro-spinal meningitis.

4. *Hernia Cerebri.*

A great deal of unnecessary importance used to be given to the condition known as hernia cerebri, as its occurrence was proportionate to the septic decomposition which characterised the condition of most of the wounds. In consequence of this latter factor we must divide the subject under the two headings of aseptic and septic hernia.

Aseptic hernia cerebri.—In consequence of the explosive effect of a bullet on the normal brain, if portions of the bones of a skull are carried away, as, for instance, in the formation of a gutter, then the rise of intracranial tension will cause a certain amount of extrusion of the brain substance. This is accompanied by extrusion of the lacerated brain against the edges[2] of the opening in the skull. Owing to hæmorrhage in the brain substance produced by the explosive effect such a hernia tends to remain only just so long as there is increased intracranial tension, as, for example, in the cases of removal of cerebral tumour, where aseptic herniæ can be studied not infrequently.

Septic hernia cerebri.—I come now to the more difficult question of septic herniæ and their significance. An infection of the bruised brain may present simply a localised suppurating cavity, in which case there is no hernia. If, however, the leucocytic barrier of the cavity is imperfect and the hemisphere in consequence happens to become the seat of general cerebritis then hernia of necessity follows, and if the mischief spreads the hernia increases because of the spreading infective œdema of the brain. The subdural leucocytic barrier may be quite effective in some cases and yet the hernia increases. This was what one finds referred to very largely in the writings of the old surgeons, and in this case undoubtedly after some time some of the increase is due to the development of granulation tissue in the brain that projects. Such herniæ, if the subdural barrier is good, yields completely to treatment with absolute alcohol and cutting away as the surface rapidly necroses. Various substances have been used for this purpose—e.g., formalin, but for many years I have never found anything better than absolute alcohol.

[2] Thus aiding in the formation of the subdural leucocytic barrier, as was first made clear by Schäfer.

FUNCTIONAL DISTURBANCE OF THE BRAIN.

The first and most important practical question is how far compensation for loss of functions due to loss of cerebral substance occurs; possibly this is a question which, though attacked by neurologists for 50 years, must remain essentially indeterminate until the function of every part of the brain is accurately ascertained. It will be simplest, perhaps, to consider the matter by two examples—first, a sensory region of the cortex, and secondly, the kinæsthetic. I desire to premise my examples by suggesting that in the human adult there is no evidence of compensation by education or substitution of function in other parts of the brain for function lost by reason of permanent destruction of given areas. Recovery due to absorption of hæmorrhage and re-establishment of partly blocked circulation, however, may be expected to go on for several years if not interrupted by epilepsy and secondary mental change.

(*a*) *Sensory Cortex.*

The most specialised centre and most clearly arranged topographically is the visual area. I will, therefore, confine my remarks to that sensory function, and a case that I saw in October last with Dr. Simpson illustrates very well the problem.

The patient, an officer in an infantry regiment, was hit by what was apparently a Mauser bullet on the right side of the head just below the parietal eminence. The bullet passed through the occipito-temporal region, making a deep gutter through the brain and under the skull, emerged through the middle of the right half of the occipital bone, and buried itself in the muscles at the back, where it was extracted by an incision on the field. The patient, who was totally blind, reached London—namely, the 3rd London Base Hospital—on about the fourth day after receiving the wound. Nothing was done to the wound on the head so far as can be ascertained. When I saw him in a nursing home on the seventh day both wounds were inexpressibly foul; the posterior two-thirds of the head was œdematous, the patient who, as before stated, was completely blind, could with difficulty be roused to an order, and his temperature was 101° F.

Under an anæsthetic the apertures in the scalp were explored by a large flap incision, and it was then found that, in addition to the comminution of the skull at the apertures of entry and exit, there was also a line of fracture and comminution about 4½ inches long connecting the holes. Further, the whole lambdoid suture was started so that the occipital bone was loose—i.e., both halves. On clearing away the fracture blood and pus came from underneath the bone, but I considered that the subdural leucocytic barrier had already sealed off much of

the subdural space. The wound was very thoroughly disinfected, irrigated with peroxide of hydrogen and sublimate lotion. As the flap incision was a very free one no further incisions were made in the œdematous skin on the left side of the head. All lacerated portions of brain tissue were removed. Besides pus there were several sloughy and dark pieces of tissue obviously necrosed. The bacteriological inspection of the head wound gave (by Major Embleton) an almost perfectly pure culture of the bacilli of malignant œdema. The patient has made a good recovery so far after frequent dressings with peroxide of hydrogen and weak carbolic lotion.

The immediate question in this case, however, is the recovery of sight. This began to return in the top right-hand corner of both fields, and has now spread until the patient can see probably over most of the upper right quadrant, but he is a good witness. The first recovery of the upper part of the field in this central case interests me because I have shown that in peripheral lesions—i.e., optic neuritis—the pressure is most severe on the upper half of the nerve and disc, and therefore preservation of sight is chiefly in the upper quadrants. (This patient had a remarkable congestion of his discs, but no true swelling.)

My immediate point is that no recovery has taken place in the gravely injured lobe; neither, I fear, can any be expected. As regards the representation of the upper and lower halves of the visual field in the lower and upper parts of the calcarine cortex and the bearing of this further consideration on the present case nothing can justly be said, seeing that the whole occipital suture being started there must have been bruising of some degree, even if slight, affecting the left calcarine region. Mr. Cruise, who has had charge of the case ophthalmologically throughout, will very kindly report on the case.

(*b*) *Kinæsthetic Cortex.*

The consideration of the loss of function of the Rolandic region is much more difficult, since paralysis of movement is no simple question of the destruction of a so-called motor centre, but also that of a number of sensation conditions and memories.

1. *Loss of movement.*—So far as the loss of motor function alone may be discussed I desire to suggest, from the experience of cases who were wounded in the South African War, that the chief movements of the hand are not restored if the whole arm area of the anterior gyrus has been destroyed.

2. *Loss of kinæsthetic memories.*—The retention of power to move a segment of a limb at all is one thing, but the ability to effect that movement without clumsiness is quite another. This depends on the conservation of what I term the topognostic sense—viz., the relation of a spot touched on the body, to our knowledge and conception of our position in space; and that chiefly in the relation of the spot touched to (*a*) the distance from the body—i.e., "proximality"; and (*b*) the distance to the mid-line of the body or "axiality." The loss of the sense of appreciation of these relations and distances is what we call, in popular language, clumsiness, and I have shown that this topognostic sense is represented in both central Rolandic gyri. Further, I believe it is permanently lost if the arm area of both gyri is permanently destroyed. Thus far, therefore, there is no compensation possible by substitution activity of the lower centres. Coarser coördinated movements of shoulder, elbow, wrist, and even of the hand, however, can be furnished by such lower activities.

THE PERNASAL OPERATION FOR FRONTAL SINUS SUPPURATION BY THE ANTERIOR ROUTE.[1]

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A FEW years ago the improved technique of operating on the frontal sinuses by the external radical method, and more particularly by the Killian operation, seemed to have solved the question as far as cases of frontal sinus suppuration attended with severe symptoms were concerned. The reported successes left the impression that skill and experience were the only essentials for a good result—that is to say, good in the sense of obtaining a cessation of discharge, headache, &c., though not seldom far from good in the cosmetic result. But these earlier successes have been discounted by several instances of septic osteomyelitis occurring in the practice of those who may justly be regarded as very highly skilful, a complication almost invariably fatal; while numerous instances of very grave deformity from absorption of the "bridge" in the Killian operation, failure to obtain cessation of suppurative discharge and headache, have made every rhinologist pause before advising a radical operation unless the symptoms are so urgent that, notwithstanding these undoubted risks, obliteration of the sinus involved must be advised. And though so far I have escaped the worst of these complications, it is, I fear, more by good fortune than the result of special skill.

Intranasal methods of securing effective drainage by the removal of the anterior end of the middle turbinate body and of the anterior ethmoidal cells around the lower end of the fronto-nasal passage, so as to render lavage of the frontal sinus, by means of a fine 2 mm. cannula, have been practised for many years, and in a large percentage of cases such lavage has proved of undoubted value. But there are many cases where either the sinus cannot be entered and lavaged at all by these methods, or where, if lavage is possible, the passage for the escape of secretions is still so narrow that the drainage is most inefficient and the symptoms unrelieved, so that some improved intranasal operation has long been a desideratum. Schäffer, Spiess, and others managed to open into the frontal sinus floor through the roof of the olfactory fissure, but the results were disappointing, and in the hands of one follower fatal, hence the method was abandoned. To Fletcher Ingals is due the credit of introducing the method of following up the tract of the fronto-nasal duct—that is, entering the frontal sinus outside the middle turbinal and through the natural frontal sinus ostium. All modern methods are developments of Fletcher Ingals's operation—e.g., the operations of Halle, Segura, &c. Unfortunately the operative methods of all these pioneers are open to grave objection on account of their inherent danger, and hence I have endeavoured to devise an intranasal operation which is comparatively safe and certainly in most cases highly efficient.

The fronto-nasal passage, in its downward course from the bony ring of the upper ostium to its lower

[1] Abstract of a demonstration in the Laryngological Section at the annual meeting of the British Medical Association.

FIG. 1.

Bone specimen showing the fronto-nasal passage with probe passing through; the dotted line shows the route of anterior entry through agger and other anteconchal cells. Note the "anterior entry" is well in front of the cribriform plate.

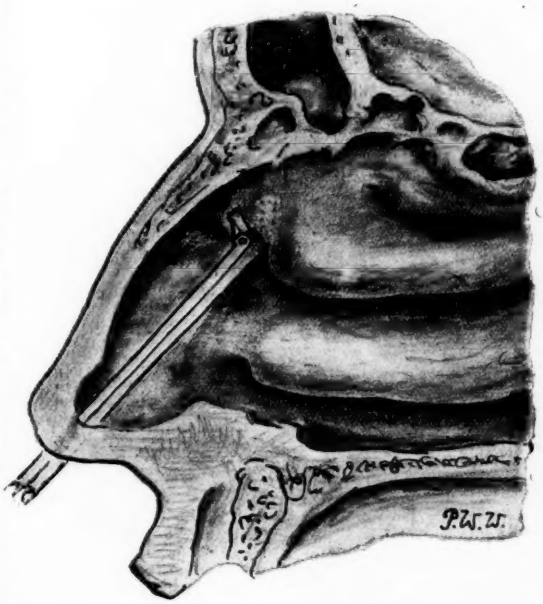
opening in the uncinate groove and infundibulum, is more or less surrounded by anterior ethmoidal cells, and of those that lie in front of this passage we recognise as fairly constant the one or two agger cells below and the usually smaller ethmoidal cells above. All these lie in front of the free margin of the anterior end of the middle turbinal, and for this group I therefore suggest the term "anteconchal cells." By opening up and removing the anteconchal cells we obtain a much more anterior or direct route to the frontal sinus than by endeavouring to locate the more posterior frontal sinus passage at its lower end and following it in its upward and forward direction, the difference between the old posterior and what I call the anterior route being obvious in the specimen. (Fig. 1.) By entering the sinus through the anterior route we keep in front of the cribriform plate, while by retaining the anterior end of the vertical plate of the middle turbinated bone, and restricting the operation to the outer side of this vertical plate, we ensure our being also to the outer side of the cribriform plate, which is the only serious danger zone if we avoid all force in introducing instruments. The operation appears a dangerous procedure unless we bear in mind that the operative field is not only outside, but also in front of the anterior extremity of the cribriform, which was not the case when operating by the old route.

The clinical and also the anatomical conditions to be dealt with largely determine the extent of the operation required. In a large proportion of patients the simple removal of the anterior ethmoidal cells by the anterior route forms a new fronto-nasal passage large enough to admit a No. 17 or No. 19 sound—i.e., the passage is about 6 mm. in diameter, and has therefore about nine times the sectional area of the normal 2 mm. wide passage. This suffices for very free drainage and the patient can usually very soon learn to wash out the sinuses daily.

Such operative measures are restricted to anterior ethmoidal cells, and though undertaken for frontal sinus suppuration they are not extended to the frontal sinus itself in any part. This removal of the anterior ethmoidal cells which obstruct the exit of discharge below the frontal sinus ostium has been the object of the intranasal operations for frontal sinus suppuration for many years, but when attempted in the more or less haphazard way of working from the lower end of the fronto-nasal passage it is a difficult matter to follow up the course of the passage, as one is working from below upwards and forwards in a dangerous area. In 1911 at the annual meeting of the British Medical Association, Mosher, of Boston, demonstrated his method of opening the agger cells *from above* and so clearing away these anterior ethmoidal cells in a systematic manner. At the same time I demonstrated the method I adopt, which effects the same result *from below and without destroying any part of the vertical plate of the ethmoid*, a point I think of import inasmuch as it does not involve fracturing through this vertical plate in close proximity to the cribriform plate and laying open venules and lymphatics in this dangerous area to the risk of infection by the purulent discharges from the frontal sinus.

Tilley has adopted Mosher's operation with this difference, that he removes the anterior end of the middle turbinal at the beginning instead of as a final step, and since February, 1914, has used a rasp for assisting in the more complete removal of the agger cells. In the more favourable cases, those in which the frontal sinus ostium is naturally large, being merely obstructed by the diseased ethmoidal cells of the fronto-nasal passage below the sinus ostium, this relatively simple operative measure is very often attended with good result.

FIG. 2.



To show the initial point of entry in the intranasal frontal sinus operation. The small spheno-ethmoidal forceps are seen cutting the point of attachment of the middle turbinal to the outer nasal wall, thus entering the fronto-ethmoidal cells

This we may term the incomplete operation. But a "complete" pernasal operation—i.e., an operation not only on the ethmoidal cells but also on the frontal sinus ostium—is called for when, in association with frontal sinusitis, the agger cells and the other anteconchal cells are poorly developed, or the nasal crest projects backward in marked degree. It then becomes necessary to remove the nasal crest by a rasp or burr, sometimes very freely, so as to afford a large entry, measuring 7 or 9 mm. antero-posteriorly by 6 mm. wide, because, after stripping the mucous membrane towards the front and removing the bone, granulations tend to close the passage in the process of healing. Thus, unless the passage is a good deal larger than seems necessary it may contract so much that the operation is ineffectual as a means of obtaining the all-essential permanent free drainage.

Operative Technique.

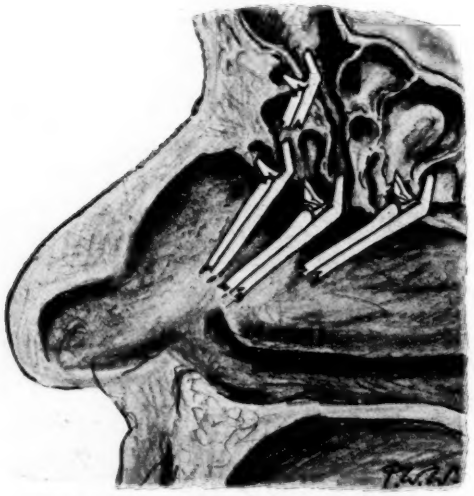
It is assumed that the extent and depth of the frontal sinuses have been determined by skiagrams prior to operation.

Anæsthesia.—Even the "complete" pernasal operation on the frontal sinus may be done under local anæsthesia, but in the majority of patients a general anæsthetic is desirable, and more especially if operation on the maxillary antrum or sphenoidal sinus is to be done at the same time. Yet, as far as pain is concerned, one may do any of the procedures described for frontal sinus disease under cocaine anæsthesia, using a 20 per cent. solution of cocaine hydrochloride with a little adrenal extract. The patient may be sitting up or lying flat on the back, or slightly inclined; it makes no difference to the ease of operation.

A. *Removal of Anteconchal Cells, the "Intranasal" or Incomplete Operation.*

1. With the small angular ethmoidal forceps engage the anterior margin of the middle turbinate at its point of attachment to the outer nasal wall.

FIG. 3.



To show the author's small spheno-ethmoidal forceps clipping down walls of the ethmoidal cells external to the vertical plate of the middle turbinal.

Cutting through this the forceps enter the anterior ethmoidal cells in front of the fronto-nasal passage (see Fig. 2).

2. Keeping to the outer side of the vertical plate of the ethmoid, clip away all the agger cells and the other anteconchal cells right up to the crista nasalis (Fig. 3).

3. The anterior ethmoidal cells lying behind or above the fronto-nasal duct, including the bulla ethmoidalis, are now removed by the forceps as far back as may be necessary.

FIG. 4.

Skiagram showing the 4 mm. wide guarded electric burr reducing the crista nasalis in a patient.

4. Using the larger forceps, the thicker projecting partitions of the cells are laid open and punched away. Only the blunt tip of the female blade can come in contact with the roof, hence with any reasonable care there is no risk of the roof being perforated.

5. The author's sounds are then passed into the sinus, so as to gauge the size of the fronto-nasal channel thus formed. Often No. 18 or 19 will enter, sometimes 19–23 or 19–25. (The figures give the circumference in millimetres; hence 19 has a diameter of 6·05 mm., or ¼ in. A 19–25 sound measures 6 mm. in width and 8 mm. in antero-posterior diameter.)

6. With the small forceps, which now enter freely, the projecting walls of any remaining ethmoidal cells may be clipped away to render the passage more free.

B. *The "Pernasal" Frontal Sinus or "Complete" Operation.*

7. If a large enough sound will not enter it may be necessary to enlarge the frontal sinus ostium, and to this end the bone corresponding to the nasal crest *may* be shaved away by the sharp rasp till these large sizes can be introduced or the crest reduced first by the smaller guarded burr. When a No. 10 sounds enters the sinus the bony boss can be further burred away with the 4 mm. wide burr until the burr enters the sinus. (Fig. 4.) When the frontal sinus opening lies well to the outer side and tends to guide entering sounds towards the orbital roof, it is well to, unless contraindicated by skiagram, draw the rasp or burr towards the front so as to enlarge the frontal ostium to the front and inwards rather than towards the orbital roof outwards. One is in front of the cribriform

plate here, and there is no danger provided the instrument is really in the sinus.

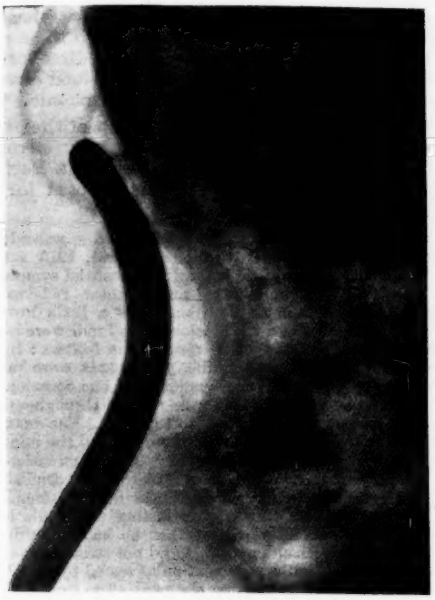
One advantage that may be claimed for this method of entry as compared with methods with unguarded burrs is that the mucous membrane is not stripped from the posterior and lateral walls of the new passage, for although the cell partitions are clipped away the mucous membrane of the cell bottom is mostly retained. Only anteriorly is the bone laid bare, and that for a strip about 6·5 mm. wide, and this can apparently recover itself by extension from the muco-periosteum on either side. Is it not better to have a 6 or 7 mm. wide passage which is lined with mucous membrane than a wider discharges disappear. 3. The use of vaccines, &c., has to be considered. But in cases of streptococcal infection it is always safer to give 30 to 50 c.c. of polyvalent antistreptococcic serum immediately before operating, and follow with sensitised vaccines.

If a sufficiently wide fronto-nasal passage to admit a bougie 15 mm. in circumference is obtained without cutting away the thick part of the nasal crest, and the sinus infection is recent, or there is no reason to believe that polypoid degeneration of the mucosal lining has occurred, I do not use a burr or other means for cutting away any part of the floor of the sinus unless subsequent observation seems to render this desirable. (Provided efficient

FIG. 5.

Skiagram showing 6 mm. thick round bougie entering frontal sinus, but carried back so as to impinge against tabula interna because the nasal crest is thick.

FIG. 6.



The same case, but showing the 6 mm. (No. 19, French scale) bougie entering well into the sinus after reduction of the nasal crest by burring.

These two Figures are from the same patient, reproduced actual size direct from the skiagram.

one stripped of mucosa which can only granulate over and which is much more liable to subsequent contraction.

At the conclusion of these procedures the sinus is well lavaged, and finally the anterior end of the middle turbinal may be removed or left for some days, as when it is left intact the channel may become narrowed by subsequent granulations. In many patients I find it unnecessary to remove any portion of the middle turbinal either at the time of operation or subsequently, and in such cases the nasal passage appears to be intact and normal except that a large fronto-nasal passage is found running up to the sinus.

After treatment.—This consists: 1. In lavage of the sinus, first with saline solutions and weak peroxide of hydrogen, and some mild antiseptic, such as colloidal or other silver preparations, iodine solutions, &c., and later with stronger solutions if necessary. 2. In the passage of the largest sound the canal will take comfortably, repeated at short intervals to prevent adhesions, and to ensure the passage remaining widely open until the sinus has become healthier, or the drainage is maintained, and the patient has been relieved of pain, headache, and inconvenient discharge, only the lesser operative measures are performed.)

I have entered more than 100 frontal sinuses by this anterior route, doing either the intranasal or the pernasal "complete" operation.

Many have been cured, nearly all have been relieved. But in some few cases it has been necessary to do an external operation subsequently, while in another small percentage it has been impossible for me to reach the sinus pernasally. These exceptional and difficult conditions I propose to discuss in another communication.

Clifton, Bristol.

INFECTIOUS DISEASES IN DUNDEE.—The monthly report of the Dundee Public Health Department shows a marked increase in the number of cases of measles and whooping-cough. Altogether 803 cases were notified during the month of January, and of these 320 were of measles, as against 175 cases the preceding month, and 384 were of whooping-cough, as compared with 132 during December. In January of last year only 324 infectious diseases notifications were made.

LIPÆMIA RETINALIS.

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THE earliest accounts of the condition of the blood to which the term lipæmia is applied are by Rollo, of London, in 1798, and Mariet, of Edinburgh, in 1799. The ophthalmoscopic picture which is associated with this condition was first seen and described by Heyl in 1880, since when very few additional cases have been reported. The appearances of the eye fundus are so striking that they cannot be overlooked, and are so characteristic that having once been seen they cannot fail to be recognised, and in addition, so far as I can discover, they form the only means, apart from a blood examination, of diagnosing the condition of lipæmia.

The two cases which form the basis of the present remarks were under the care of Dr. A. E. Garrod, Dr. J. Calvert, and Dr. Morley Fletcher at St. Bartholomew's Hospital, to whom I am indebted for permission to publish them.

CASE 1.—The patient, a man aged 23 years, was admitted under the care of Dr. Calvert on Oct. 2nd, 1914, suffering from diabetes mellitus. He had all the essential symptoms of the disease. His knee-jerks and plantar reflexes were absent, he had lost much flesh, and was a little drowsy on admission. He was of a fresh colour; his fundi were normal. The examination of the urine resulted as follows: Specific gravity 1031; reaction alkaline, phosphates were present. Albumin was present in small amount on one occasion only. Acetone and aceto-acetic acid were present throughout. The quantity passed varied from 7 to 13 pints. The maximum quantity of sugar passed was 266 grammes and the minumum 139 grammes in 24 hours. On Nov. 9th examination with the ophthalmoscope at 11 A.M. revealed the condition of lipæmia retinalis, and the appearances had not changed at 6 P.M. The patient said he was feeling very well, but on inquiry the Sister informed me that he had been drowsy. His colour was fresh and good; it did not strike me as being abnormal. His capillary circulation as tested by pressure on the finger nail was as free as my own. The composition of his alveolar air was examined on three occasions by Dr. George Graham with the following results: Nov. 9th, 7 P.M., 2·56 per cent. CO_2; 10 P.M., 2·2 per cent. Nov. 10th, 9 A.M., 1·0 per cent. On the morning of Nov. 10th air-hunger was very apparent. Ten ounces of blood were withdrawn from the arm by Mr. H. J. Bower and examined by Dr. T. H. G. Shore and Mr. W. H. Hurtley. The patient died in coma at 2.15 P.M. A post-mortem examination was not permitted.

CASE 2.—The patient, a woman aged 25 years, was admitted to John Ward on April 19th, 1905, under the care of Dr. Garrod suffering from diabetes mellitus; she had previously been admitted under Dr. Garrod and also under Dr. Morley Fletcher. Her symptoms were of 15 months' duration. From March to June, 1904, she was under Dr. Garrod's care. At this time she was passing 5 pints of urine, with a specific gravity of 1045, in 24 hours; the amount of sugar was 4·2 per cent., and a strong ferric chloride reaction was present. The eye fundi were normal. On her discharge the amount of urine was reduced to about 50 ounces, sugar was absent, and thirst had disappeared. From Nov. 4th, 1904, to Feb. 8th, 1905, she was under Dr. Morley Fletcher's care. She was now passing from 5 to 8 pints of urine, which contained 5·2 per cent. of sugar, and a strong ferric chloride reaction was again present. She was sent to a convalescent home on Feb. 8th, having gained 9lb. in weight; her urine still gave a marked iron reaction and contained 4·6 per cent. of sugar. The eye fundi were normal. On April 19th she was readmitted under Dr. Garrod. She was suffering from marked dyspnœa and had vomited. Her breath smelt strongly of acetone. Her knee-jerks and plantar reflexes were absent. The urine had a specific gravity of 1020, contained much sugar, and showed a well-marked iron reaction. She died in coma 44 hours after admission. Twenty hours before death venesection was performed by Dr. F. A. Hepworth, and a high degree of lipæma was so discovered. The fundus oculi was now examined, and the striking appearances of lipæmia retinalis were seen. A post-mortem examination was not obtained.

Ophthalmoscopic appearances.—Case 1.—The fundi were examined 27 hours and again 20 hours before death, and the condition of the blood was recognised by this means. The abnormal features were almost entirely limited to the appearance of the retinal vessels. These were of a salmon colour on the disc and for a short distance beyond, but when traced towards the periphery the colour became much less saturated, and gradually merged into a cream colour with almost no pink tinge. The colour of arteries and veins did not differ at all. In the centre of the disc a faint central light streak was seen on the arteries, and by this means, but by no other, could the arteries be distinguished from the veins; towards the periphery both sets of vessels were identical in appearance. Both arteries and veins were well filled, perhaps a little abnormally so, but there was no turgidity or obvious distension. The general tint of the fundus was rather pale. The optic disc was normal in appearance, its edges were perfectly sharp and clear-cut, and there were neither hæmorrhages nor exudates anywhere to be seen.

Case 2.—The foregoing description would apply in every essential particular to this case, but there were two differences of degree. The colour of the vessels was of a more saturated salmon pink and extended further outwards into the peripheral vessels, and all the vessels, whether arteries or veins, were markedly distended and therefore tortuous; they were about twice their normal diameter.

Lipæmia is described as occurring in a number of widely differing diseases—e.g., chronic alcoholism, phthisis, asphyxia, nephritis, phosphorus poisoning, pneumonia, peritonitis, gout, starvation, and diabetes. I have, however, been unable to discover any reported case in which lipæmia retinalis was observed, except where diabetes was the cause.

A description of the appearances seen with the ophthalmoscope is given by the following observers: Heyl,[1] Hale White,[2] Fraser,[3] Futchner,[4] Heine,[5] Reiss,[6] and Turney and Dudgeon.[7] All were cases of diabetes in young subjects; the oldest was 35, the youngest 17, and the average age was 24. In several of these cases a general pallor of the fundus is described, and in two cases some visual defect, but otherwise in no case is any abnormality described except as regards the appearance of the retinal vessels. The colour of the vessels is the most striking feature, arteries and veins being quite indistinguishable from each other by this means. There is general agreement in describing the largest vessels as being salmon-coloured and the peripheral vessels as being cream-coloured; differences exist only as to the distance towards the periphery to which the salmon-colour extends.

So far as can be judged from the descriptions of reported cases, the intensity and extent of this salmon tint were greatest in the present Case 2; whilst at the other extreme, in Heine's[5] case the vessels looked as if they contained milk and not blood; in Fraser's[3] case the vessels are described as being white; and in Turney and Dudgeon's[7] report it is stated "the only place where anything approaching a red tint is seen is in the vessels as they come up into the centre of the disc. Before they have crossed the disc this has completely gone, to be replaced by a pale cream colour."

The change of colour of the retinal vessels is so striking that one is tempted to conclude that this implies a chemico-physical change in the hæmoglobin. In no case that I have found has a spectroscopic investigation of the blood been carried out,

and in the absence of any such evidence of change in the blood pigment there are grounds for attributing the altered appearances solely to the opacity of the plasma. Thus the only situation where this change of colour is seen is in the retinal vessels; the general tint of the fundus, which is dependent upon the light reflected from the choroidal vessels, may be a little pale but is not otherwise altered, nor is that of the cheeks. It must be borne in mind that the retinal vessels are peculiar in this, that resting as they do upon the surface of the retina light is reflected direct from their central axial stream without having to traverse any but transparent media. In the case, however, of the normal choroidal vessels the light reflected from them has to traverse a light diffusing medium in the form of the retina with its pigment epithelial layer, and consequently the *normal* choroidal vessels, as seen with the ophthalmoscope, differ markedly in appearance from *normal* retinal vessels. When now the central axial stream of the retinal vessels is surrounded by a plasma, which on separating has the appearance of cream, the effect of a ground-glass instead of a transparent envelope is produced.

Much diffusion of the light reflected from the axial stream results from this, and in this particular the condition of *normal* choroidal vessels is approximated, and consequently the appearance of the two sets of vessels as seen with the ophthalmoscope is very similar. This is seen in three particulars—viz.: 1. The "ground-glass" effect of the opaque plasma does away with the central light streak seen in normal retinal vessels, as a consequence of which the cylindrical contour is lost, and the vessels have the appearance of flat bands or ribbons as is seen in normal choroidal vessels. 2. The colour of the retinal vessels in lipæmia, where the salmon tint is moderately saturated, is almost exactly that of normal choroidal vessels. 3. In both instances there is the difficulty of distinguishing arteries from veins. It is probable, therefore, that the marked change in colour of the retinal vessels is due entirely to the condition of the plasma, and does not imply a change in the blood pigment.

Distension of vessels.—In none of the reported cases are the vessels described as being less well filled than normally, but in several there has been a well-marked degree of distension of them. In Case 2 both arteries and veins were very full and turgid; they were not less than twice their normal diameter, and this was also the case in Heyl's patient; in the remaining cases, however, distension was not conspicuous, the vessels are described as being well filled (Turney and Dudgeon), a little larger than normal (Hale White), rather dilated (Heine), and this last description would apply to Case 1.

Vision.—There may be very marked lipæmia of the retina without any serious interference with vision. In Case 1, 27 hours before death, in reply to an inquiry, the patient said he did not notice any alteration in his sight, he could see about the ward quite well, and could read a newspaper rapidly and without trouble. Turney and Dudgeon say of their patient that "so far as rough tests go her vision may be described as normal," and in Heine's case, though the vessels looked as if they contained milk and not blood, there was "no difficulty with vision." In the cases of Reis and Heyl there was loss of vision; it would seem possible, however, that the defect in these cases was due to an accompanying retrobulbar neuritis and not necessarily due to the presence of lipæmia. The optic disc is always quite clear, and there is no obvious œdema of the retina, nor are there areas of exudate, and it is a striking fact that retinal hæmorrhages which so readily occur in altered conditions of the blood have never been recorded in lipæmia.

Prognosis.—There is no doubt that lipæmia of such degree as to give rise to the appearances of lipæmia retinalis implies a grave condition, for I have been able to find one case only in which the patient survived after its discovery. It is, however, clear that recovery is possible and that the normal appearance of the fundus may be restored, for Hale White says of his case that "the colour of both sets of vessels became more healthy, and was quite natural after he had been in two months."

Whilst, then, with a general improvement in the patient's condition lipæmia may disappear, there are grounds for surmising that towards the end of the patient's life it may also disappear and constitute an omen of grave import. It has been shown that a large ingestion of fat increases the amount of neutral fats in the blood, and the plasma may be milky from this cause (Schäfer[8]). The fat in the blood in lipæmia, however, is independent of food taken (Naunyn,[9] Gerhardt[*]), and its source would seem to be the reserve stores of body fats, as is the case in the lipæmia of starvation (Hunter[22]). If, then, in a case of diabetes the patient should escape coma sufficiently long for his store of body fat to become exhausted, it might well be expected that lipæmia, if previously present, would disappear. Whether in fact this does occur one cannot state; it did not happen in either of the present cases, but in neither was there marked emaciation. It was, however, demonstrated by Boggs and Morris in their experimental lipæmia (*vide infra*), and the cases of Turney and Dudgeon and of Zandy[10] lend some colour to the possibility of its occurrence in man.

Turney and Dudgeon found at the post-mortem examination of their case that "the great omentum had a very remarkable appearance, in that all the fat was gone from it and the tissues had a gelatinous appearance; all the fat round the viscera was similar, and this was well seen in the heart." The subcutaneous fat, although diminished, had not disappeared. Corresponding with this disappearance of the body fat they find that, whereas film preparations of the blood obtained during life showed a very large number of fat droplets of all sizes, similar films of the blood obtained post mortem, prepared by the same method, failed to show the slightest evidence of fat. They were, however, able to show abundance of fine fat granules in the tissue cells. Similar observations were made in Zandy's case.

Turney and Dudgeon suggest that this "disappearance of the fat from the blood in the large vessels is a vital phenomenon conditioned possibly by the febrile state of the last few days of the patient's life"; it would seem, however, that the remarkable manner in which the stores of body fat had become exhausted might supply an explanation of this.

Differential diagnosis.—Heyl in his original paper suggests a certain similarity to leukæmic retinitis. The very characteristic colour of the retinal vessels in lipæmia is entirely absent in leukæmia; this alone would differentiate the two conditions. In addition, however, in leukæmic retinitis the veins are usually greatly more distended than the arteries, especially in the myelogenic variety, and hæmorrhages are always present; these features are

* Gerhardt reports the case of a dog which had spontaneous diabetes; the blood contained 12·3 per cent. of fat, though the animal had had no food for nearly 24 hours.

absent in lipæmia. I do not think that lipæmia retinalis having once been recognised would ever be confused with any other condition.

Experimental lipæmia.—Czerny[11] made the following experiment:—

Fat was injected into the jugular vein of a dog, it having been first ascertained that the eye fundi were normal. Forty-eight hours after the injection numerous hæmorrhages were present in the retina, but there is no mention of appearances at all like those of lipæmia. The retinal hæmorrhages in this case were no doubt due to the presence of minute fat emboli, and their method of production was almost certainly precisely similar to that of the retinal hæmorrhages so usually seen in cases of infective endocarditis.

Boggs and Morris[12] produced lipæmia by bleeding rabbits to the extent of 25 c.c. on six days out of seven for a period of some weeks. In from 8 to 16 days, when the red cells had been reduced to about 2,000,000 per c.mm., the serum became milky; when, however, the bleeding was continued over long periods the animal became intensely emaciated, all the coarse body fat disappeared, and the serum lost its milky character. There is no mention of the appearance of the eye fundus in these experiments.

These experiments would seem to lend support to the surmise that should a lipæmic patient survive sufficiently long to become greatly emaciated the lipæmic condition of the blood might disappear.

Boggs and Morris, as a result of their observations, suggest that lipæmia may occur clinically in cases of anæmia, and state that they have seen a moderate degree of it in a case of anæmia secondary to hæmorrhoids. In any case of severe anæmia, pallor of the fundus as of the skin is present, and the retinal vessels, both arteries and veins, have a paler tint than is normal, and show less difference than is usual between the colour of the two sets of vessels. These appearances are, I believe, entirely due to the dilute condition of the blood in such patients. I have examined the fundi of 36 patients admitted to the wards of St. Bartholomew's Hospital suffering from severe secondary anæmia, which was due in most cases to bleeding from gastric or duodenal ulcers.

The average blood count of these 36 patients was 2,506,000 red cells, and the average hæmoglobin percentage was 40; in one case the red cells were so few as 580,000. In most of these the pale colour of the vessels is noted, and in two cases the approximation in colour between arteries and veins is specifically remarked. Retinal hæmorrhages in the vicinity of the disc are so common as to be the rule.

It is worthy of note that in two of these cases Boggs and Morris's experimental conditions were in large measure fulfilled. Both had had bleeding piles for many years, one of them for ten years, and in both severe anæmia had resulted. The blood examinations were as follows:—

Case 1 ... Red blood cells, 2,790,000 ..... Hæmoglobin, 34 per cent.
„ 2[13] ... „ „ 3,900,000 ..... „ 40 „

In the latter of these two cases severe impairment of sight had resulted from the continual loss of blood, and further testimony of the extent to which this slow bloodletting had progressed was evidenced by the degree to which his blood-forming tissues had undergone compensatory hyperplasia; seven weeks after his piles had been ligatured by Mr. R. C. Bailey his red cells had increased to 6,200,000, his hæmoglobin percentage to 105, and his now extraordinarily florid appearance contrasted markedly with his previous bloodless condition.

In neither of these two cases nor in any of the 36 cases mentioned, however, were the appearances of the fundus at all like those seen in lipæmia, nor have I seen anything similar in chlorosis or pernicious anæmia.

No doubt low or moderate degrees of lipæmia may exist without causing visible retinal changes. Normal plasma contains from 0·2 to 0·5 per cent. of fats, either as glycerides or cholesterin esters of the fatty acids, and under certain physiological conditions these amounts may be exceeded without producing retinal changes. Heine believes that the appearances of lipæmia retinalis are only produced when the amount of fat in the blood reaches 4 or 5 per cent.; it may occasionally rise so high as 15–18 per cent. (Umber, F.[28])

Conclusions.

Lipæmia retinalis occurs in young diabetics who are usually bordering on coma, and it consequently implies an immediately grave prognosis, but recovery from the condition may occur.

It implies a high degree of lipæmia, and it is probable that in no condition other than diabetes does lipæmia attain a sufficiently high degree to give rise to the appearances of lipæmia retinalis.

Vision may remain unaffected in spite of a very high degree of lipæmia retinalis.

The conspicuous changes in colour and appearance of the retinal vessels are probably entirely dependent upon the opacity of the plasma, and do not indicate a change in the hæmoglobin.

Lipæmia retinalis supplies so striking and characteristic an ophthalmoscopic picture that it cannot be overlooked nor mistaken for any other condition.

Examination of the Blood by Dr. T. H. G. SHORE.

The blood was taken from the median basilic vein, and as it flowed had a noticeably milky or chalky tinge. After a very few minutes the quantity collected in the bleeding bowl showed a whitish layer collecting on the surface. The blood clotted rapidly, and as the serum separated the whitish material separated with it, giving the appearance of blood mixed with milk or cream. Some of the blood was taken straight into a centrifuge tube, and after coagulation had taken place was separated into two layers; the lower, about half the volume of the blood, looked quite normal, but the upper consisted of the milky serum looking after this treatment more than ever like milk. No separation of the constituents of the upper layer could be effected by the centrifuge. The opacity could not be removed by treatment with ordinary quantities of ether, but a slight greasy mark remained on blotting-paper after the evaporation of the ether, showing that some small amount at any rate appeared to be due to an ether-soluble fat. Under the microscope red and white corpuscles were quite normal in appearance. An actual count was not done. Lying free in the serum, both in the fresh blood and in the centrifuge-separated serum, a very large number of minute feebly refractile spots were to be seen, not at all like globules of fat, and no such globules could be seen. These small bodies did not appear to be crystalline, and could not be made to stain with Soudan III. They were not visible in a film stained by Leishman's or Jenner's methods. The presence of intra- or extra-cellular glycogen could not be demonstrated.

Chemical examination by Dr. Hurtley is not yet complete, but an interesting point has been made out in the total absence of β-oxybutyric acid in the blood, although the smell of acetone was very apparent in the breath, the blood, and the urine.

Bibliography.—1. Heyl: Transactions of the American Ophthalmological Society, 1880, p. 54. 2. Hale White: THE LANCET, 1903, vol. ii., p. 1007. 3. Fraser: Brit. Med. Jour., 1903, vol. i., p. 1205. 4. Futchner: Journal of the American Medical Association, 1889, vol. xxxiii., p. 1007. 5. Heine: Klinische Monatsschrift für Augenheilkunde. 6. Reis: Archiv für Ophth., lv., p. 438; Archiv, vol. lv., p. 3. 7. Turney and Dudgeon: Journal of Pathology, 1906, vol. xi., p. 50. 8. Schäfer: Text-book of Physiology, vol. i., p. 159. 9. Naunyn: Der Diabetes Mellitus, Wien, 1898, p. 239. 10. Zaudy: Deutsches Archiv für Klinische Medizin (Leipzig), 1903, Band lxxvi., S. 270. 11. Czerny: Berliner Klinische Wochenschrift, 1875. 12. Boggs and Morris: Journal of Experimental Medicine, 1909, vol. ii., p. 553. 13 Foster Moore: St. Bartholomew's Hospital Reports, 1910, vol. xlvi., p. 179. 15. Traill: Edinburgh Medical and Surgical Journal, 1823. 16. Gamgee: Physiological Chemistry of Body, London, 1880, vol. i., p. 170. 17. Küssmaul: Deutsches Archiv für Klinische Medizin, Band xiv., S. 4. 18. Shattock: Transactions of Pathological Society, 1903, p. 218. 19. Schwarz: Deutsches Archiv für Klinische Medizin, 1905, Band lxxvi., S. 270. 20. Fischer: Virchow's Archiv, 1903, Band clxxii., S. 30, 218. 21. Starr: New York Medical Record, vol. xvii., p. 477, 1880. 22. Hunter, Wm.: Allbutt and Rolleston's System of Medicine, vol. iv., part 1, p. 48. 23. Langermann: Zeitschrift für Medizin, Berlin, 1912, Band xxv., S. 647. 24. Weil: Münchener Medizinische Wochenschrift, 1912, Band lix., S. 2096. 25. Neisser and Derlin: Zeitschrift für Klinische Medizin, Berlin, 1903, Band li., S. 423. 26. Coote: THE LANCET, 1860, vol. ii., pp. 232, 258. 27. Fawcett and Boycott: Transactions of the Pathological Society, 1904, vol. lv. 28. Umber, F.: Nutrition and Diseases of Metabolism, 1914, Berlin, p. 223. 29. Klemperer and Umber: Zeitschrift für Klinische Medizin, 1907, Band lxi., S. 145. 30. Bürger and Beumer: Zeitschrift für Experimentelle Pathologie und Therapie, 1913, Band xiii.

Bentinck-street, W.

THE OPERATIVE TREATMENT OF BULLET WOUNDS INVOLVING THE VERTEBRAL CANAL AND ASSOCIATED WITH COMPLETE PARALYSIS.

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DURING a prolonged visit to Antwerp I had under observation in the various hospitals six cases of lesion of the spinal cord caused by shrapnel or rifle bullets. In the worst two cases of the series where the symptoms suggested complete severance of the cord I advised exploratory operations, and through the kindness of the medical men in charge of the cases (Mr. H. S. Souttar, of the British Field Hospital, and Dr. Bremken, of the Elizabeth Hospital) I was permitted to perform laminectomy. The observations made during and after these operations appear to me to be of some interest, for in each case the cord and dura mater were found intact, although both patients displayed an almost complete loss of all reflexes and complete flaccid paraplegia. These symptoms, I consider, were due to intradural hæmorrhage, while the history of the two cases appears to indicate that operative procedure may be beneficial.

CASE 1.—Patient, aged 28, married, one healthy child. Examined first Sept. 19th, 1914. He was wounded on Sept. 10th, but was unable to say whether by shrapnel or bullet. At the time he was injured he estimated that the enemy were 200 metres distant. When hit he felt a blow and fell down, at the same time losing all sensation in both lower limbs, the right arm, and trunk. He was carried half an hour by comrades, travelled by vehicle for half an hour, then by motor to Aerschot, and from thence to Antwerp by rail. When admitted to the British Field Hospital he was in collapse and saline injections were administered. At this time the pulse was 120, vomiting was persistent, and 60 oz. of urine were removed after his arrival. It was found necessary to catheterise the patient twice daily. On Sept. 17th he was taken down to the X ray laboratory, when severe vesical hæmorrhage occurred and the patient again collapsed; the pulse rose from 90 to 145; temperature was 38·9° C. Digitalis and pituitrin were given, and after six hours he recovered. The urine was at this time strongly alkaline with an ammoniacal odour, while there was a suspicion of pus. The large quantity of blood in the urine made it impossible to examine it accurately. The vesical hæmorrhage was very troublesome for three days, during which time adrenalin washings were used and ergotine was given internally. After this attack the patient improved somewhat, being able to take nourishment, but incontinence of both urine and fæces continued. The examination of the patient's back showed the point of entrance of the bullet at the level and to the left of the sixth dorsal spine as a brownish wound about the size of a halfpenny with slightly inflamed edges, but little, if any, exudate. At the right shoulder, where the bullet made its exit, the humerus was broken while the whole region was swollen and had a profuse purulent discharge.

The physical examination made on Sept. 19th, 1914, may be taken as presenting a general view of the patient. At this time he was a broad-shouldered, well-built man with a pulse of 90, but weak in character. There was absolute loss of motility and sensibility below a line passing through the upper part of the ensiform cartilage, or about the level of the seventh rib. Immediately above this level the patient complained of continuous pain and irritation over a girdle area. Associated with these distressing symptoms was a feeling of numbness ("as if swollen") also over the same area. Over the whole body below this line the reflexes had almost disappeared. The abdominal and knee reflexes were gone, but a very slight cremasteric reflex was apparently occasionally elicited. The true plantar reflex was absent, but after repeated deep pricking of the sole of the foot a slight flexion of the great toe was observed, evidently as the result of summation of stimuli. It was further noticed that this reaction was better marked if the patient was instructed to make a fist during the application of the stimulus. The Achilles jerk was elicited in a slight degree on both sides when the gastrocnemius was tapped with a metal hammer. The mobility of the hands and fingers appeared normal; any restriction of the movements of the right arm was due to the complicated fracture of the humerus. The abdomen showed marked dermography. There was no upward movement of the umbilicus when the attempt to sit up was made. There was complete anæsthesia in regard to all forms of sensibility all over the body below the girdle zone of hyperæsthesia already described. Repeated lumbar punctures failed to get any cerebro-spinal fluid. The X ray photographs gave no information as to the nature or character of the deep lesion. On Sept. 20th, 1914, the field hospital not being provided with the necessary apparatus, Dr. Benham (the physician in charge of the case) invited Dr. Sano to come and examine the case with his portable apparatus. Dr. Sano stated that the rapid contraction of the quadriceps elicited on closing the galvanic current was more marked at the negative than at the positive pole. With the faradic current a moderately strong convulsion of the quadriceps was provoked, but if the electrodes were applied over the nerve the contraction was slow and wormlike.

From a general consideration of the symptoms it seemed possible, and even probable, that the lower part of the cord had nervous connexion with the upper, and further, that the symptoms might be caused by particles of bone pressing on the cord. As there was not the slightest sign of spontaneous improvement—on the contrary, a bedsore developed in the right heel, it was decided to do an exploratory laminectomy. The operation was performed on Sept. 24th. At the time of operation the patient was rather weak, pulse rapid and weak, and temperature 39·4°, this rise being the first of that degree during his stay in hospital. The hæmorrhage from the bladder was still present, but Mr. Souttar's urethroscopic examination indicated that it was due probably to vasomotor disturbances. The patient was placed in the prone position usual in kidney operations, and the posterior wall of the vertebral column from the second to the seventh dorsal vertebræ removed. The cord so exposed was found to be non-pulsating, and it was necessary to remove a higher vertebral arch so as to expose the normal cord. The dura mater over the non-pulsating part of the cord was exceedingly tense, while the cord appeared to be of about twice its normal volume. The sides of the vertebral column were rapidly examined, but nowhere was any injury to the dura mater found. The condition of the patient necessitated the administration of saline and strychnine, and no time could be spent in attempting to examine the frontal portion of the cord, but the reappearance of pulsation in the cord was taken as proof that the operation had succeeded in relieving pressure. The wound was closed with silk and horsehair sutures. Sept. 26th: The temperature went down at once after the operation, while the distressing girdle pains ceased. Dr. Sano stated that the upper border of

anæsthesia had become lowered some 3 to 4 cm. or to the level of the ninth rib. The knee-jerk was still absent, but the plantar reflex was almost brisk on the right side. Sept. 29th: The anæsthesia had receded to below the costal arch. The right plantar reflex was practically normal, while the left was elicited only after repeated stimulation. I had to leave Antwerp on Sept. 30th, and further notes of the case have not yet reached me, but the patient is said to be in much the same condition (in Ostend, Oct. 10th).

In this case the loss of the deep reflexes would, according to Bastian, have led one to suspect complete rupture of the cord. The slight contraction of the gastrocnemius, elicited by tapping the tendon with the hammer, might have been taken as the result of direct muscular irritation, while the slight plantar reflex might have signified only that the lower part of the cord was intact. The two facts which led us to suspect that the bullet had passed over but had not ruptured the cord were the absence of the complete reaction of degeneration after nine days (Sencert),[1] and that muscular exertion of the left hand (the right arm being injured) tended to increase the slight rest of the plantar reflex. It is evident from the post-operative history that these suspicions were justified, and that no complete rupture of the cord existed.

CASE 2.—Patient, aged 21, wounded Sept. 9th, 1914, at Aerschot. Examined Sept. 26th. A wound made by the entrance of a rifle bullet was found in the left flank at the level of the fifth dorsal spine; the exit of the bullet was at a point 4 cm. to the right of the ninth dorsal spine. When struck the patient fell down and was instantly paralysed. He suffered severely from lancinating pains extending downwards to both knees, and there was incontinence of both urine and fæces. Below the level of the second lumbar segment there was complete loss of motility, while the reflexes were almost completely lost. Irritation of the skin below the scrotum, if continued for 10 to 20 seconds, was followed after an interval of about the same time by a slight contraction of the cremasteric muscle on the same side. With the faradic current both the peroneus and gastrocnemius reacted subnormally; on both sides the kathode make-and-break current resulted in approximately an equal contraction of both muscles. There was a large eschar on the right buttock, which was continually irritated by urine and fæces. Operation for this desperate case was, in consultation with Dr. A. Claus, decided on, and in preparation the eschar and the bullet wounds were treated with tincture of iodine the day preceding the operation. The cord was exposed between the fifth and seventh dorsal spines. The dura mater was exceedingly tense, while the cord was non-pulsating and much increased in volume. The dura mater was quite uninjured. Here again the bullet had passed by the side of the cord. Dr. Bremken and I were, however, able to satisfy ourselves as to the presence of certain splinters of bone which were pressing on the cord. These splinters we were not able to remove completely, but on pressing them back pulsations returned to the cord. It was decided not to open the dura mater because of the risks of infection, and the wound was closed. Sept. 29th: The patient vomited a great deal after the operation, and the temperature went up to 39·6° C., the pulse being 150. The dressing, which was soaked with blood, was removed and replaced by fresh dressing. A little later the temperature fell, and the patient said that a certain degree of "feeling" had returned to his legs. During the first few days of October this patient was forwarded to Ghent. I have not been able to gather any further information about him.

In severe cases of injury to the spine the important question is whether to operate or not. In all other fractures and dislocations the surgeon has a valuable guide in the X ray photograph, but it is of less use for injuries of the back. In fact, each case must be judged on its own merits, and no rule for general guidance can be formulated. We do not refer to neurological symptoms, on which a diagnosis of complete or incomplete rupture of the cord, might be based.

It has of course been definitely shown (Bastian, Bruns) that where the cord is completely severed the deep reflexes are lost, but the mistake must be avoided of assuming from an absence of reflexes that the cord is completely cut. Sano[2] long ago urged the necessity for more frequently exploring these cases, but so lately as 1909, in a discussion held by the French Association of Surgery, the general feeling was distinctly adverse to exploratory laminectomy because of the uncertainty of diagnosis. Electrical examination is advocated by Sencert[3] as an aid in diagnosis; it is certainly helpful, but not infallible.

From my limited experience I venture to draw the following conclusions. 1. The absence of all deep reflexes must not be taken as an absolute proof of complete rupture of the cord. 2. The rapid fluctuation in pressure caused by a passing bullet appears to be sufficient to damage seriously the blood and cerebro-spinal fluid circulation in the cord and to induce complete flaccid paraplegia. It is probable that the pressure exerted by bony splinters is of secondary importance. 3. In cases of paraplegia following on bullet wound to the vertebral column, when there is no recovery of mobility or sensibility ten days after injury, laminectomy appears to be justified. 4. If the opening of the bony canal is not sufficient to restore pulsation in the cord the theca should be opened and the blood clot removed as thoroughly as possible.

It must, however, be pointed out that sanguine hopes of complete recovery should not be entertained. From our experience with caisson paralysis it is evident that the cord is peculiarly liable to damage through variations in pressure. Air bubbles are in such cases formed in the grey matter. It appears quite possible that a bullet passing the intravertebral canal, but leaving the cord itself unhurt, may cause, besides intrathecal hæmorrhage, similar lesions. It will be rarely, if ever, possible to remove the blood clot completely, and further experience must be looked for in order to ascertain whether lasting amelioration in such cases will ensue. Also local serous meningitis may supervene, and in such cases it is highly probable that the patient may benefit from the operation.

[1] XXVme Congrès de Chirurgie, 1912, Paris.

[2] Archives de Neurologie, 1898.

[3] XXIIme. Congrès de Chirurgie, 1909, p. 842.

A CASE OF ACUTE TETANUS WITH RECOVERY.

(From an Evacuation Hospital, British Expeditionary Force, France.)

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THE following is a report of a case of severe acute tetanus with recovery, no prophylactic dose of antitetanic serum having been given.

Private ——, wounded on Oct. 22nd, 1914, was admitted to this hospital on Oct. 26th with two shrapnel wounds, one, a large deep ragged septic wound situate on the anterior surface of the right thigh, about the junction of the middle and lower thirds, involving the extensor muscles, and passing upwards and backwards for about 3½ to 4 inches, cone-shaped in character; the other wound, situated on the posterior aspect of the left knee-joint, being about 2 inches by 1 inch in size and quite superficial,

with a certain amount of inflammation surrounding it. The wounds were thoroughly cleaned up and the damaged tissue removed, irrigated, and dressed with fomentations. For the next few days the large wound was treated with iodine irrigations and boracic fomentations, the latter four-hourly, and the patient was apparently doing well.

On Nov. 1st, at 9.30 A.M., the patient complained of slight stiffness in the jaws and the muscles at the back of the neck, also that the wound in the thigh was "burning" very much. Temperature 99°F. Tetanus was at once suspected, and on inquiry it was ascertained that he had received no injection at the clearing hospital. The wounds did not appear worse; they were cleaning up fairly well. He was given a mixture containing the three bromides, iodide, and nepenthe, four-hourly, and an injection of morphia ¼ gr. was administered. In the afternoon he received an injection of 1500 units of antitetanic serum subcutaneously. In the evening the wound in the thigh was causing intense pain and "burning very much"; temperature 100°. He received an injection of morphia gr. ¼, and calomel was administered. On the 2nd the morning temperature was 100°. Trismus was very marked, risus sardonicus was obvious, and there were jerking movements all over the body. He received a further injection of 1500 units of antitetanic serum subcutaneously. On the 3rd the temperature was 100°. The patient was removed to a small darkened ward by himself. He now had very marked and violent jerking movements, and arching of the back. The abdomen was retracted and very hard and board-like. He was unable to be fed by the mouth and rectal alimentation was resorted to. On the 4th the patient's condition was about the same. He was given an injection of antitetanic serum intrathecally of 3000 units; chloral hydrate gr. xx. was given four-hourly, and the bromide mixture was discontinued. The injections were administered by Major (temporary) B. Hudson. The wounds were progressing satisfactorily, but were still very painful. Temperature 100°. On the 5th the wounds were less painful and the patient felt better. The jerking movements, especially of the legs, were still marked and the trismus, &c., were still present. On the 6th the temperature was 100°; stiffness of the jaws was relaxing and the jerking movements were less violent. The bromide mixture was resumed. On the 8th the trismus was less marked and the temperature was normal. On the 12th the patient was very cheerful. The jerking movements and the trismus were very slight and the wounds were clean. On the 18th all signs of tetanus had quite disappeared and the patient felt well. On the 22nd he was discharged to hospital ship.

ST. MARK'S HOSPITAL FOR CANCER, FISTULA, AND OTHER DISEASES OF THE RECTUM.—On Feb. 11th Sir Richard Biddulph Martin presided at the annual general meeting of this hospital, and in moving the adoption of the report referred to the improvements which had been made in the nurses' quarters and in the operating theatre. The finance and general work of the hospital were satisfactory. The War Office, he said, had accepted the hospital's offer of 12 beds for the wounded and three of the hospital's five surgeons had volunteered for active service. The seventy-ninth annual report, which was adopted, showed that during 1914 the total number of new out-patients was 1966, as compared with 1854 in 1913, and that the number of in-patients admitted last year was 732, as compared with 641 in the previous year. The number of operations was 686.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

Ruptured Unilateral Solid Cancer of Ovary Removed.—Squamous-celled Carcinoma.—Inversion of Uterus.—Exhibition of Specimens.

A MEETING of this section was held on Feb. 4th, Dr. W. S. A. GRIFFITH, the President, being in the chair.

Dr. HERBERT SPENCER read notes of the case of a patient, aged 27, who had a Ruptured Soft, Solid Growth of the Left Ovary, measuring 5¾ by 3½ inches, with about a gallon of free blood-stained fluid in the peritoneum. The tumour was removed; the other ovary, appearing healthy, was left behind. The patient subsequently had two children and remained well seven years after the operation. Similar cases were recorded by Hofmeier and von Velits. The tumour had the microscopic characters of a medullary carcinoma. Dr. Spencer did not agree with Pfannenstiel's opinion that in all cases of unilateral papillary tumours, cancer and endothelioma of the ovary, the other ovary should be removed, for he had seen examples of all those conditions remain well seven years after unilateral ovariotomy. He suggested, however, that, notwithstanding its microscopic characters, it was possible that the specimen shown was not malignant.—Dr. CUTHBERT LOCKYER said that he was not convinced from a casual examination of the microscopic section of Dr. Spencer's specimen that it was a carcinoma; he thought it would very likely prove to be an endothelioma, and if that were so the long immunity from recurrence would be more easy to understand, as endothelioma of the ovary was far less malignant than solid carcinoma of that organ.—Dr. HENRY BRIGGS remarked that the tumour shown and admirably described by Dr. Spencer stirred the unsettled problem as to what these tumours really are. As solid adenomata, in the Departmental Museum of the University of Liverpool, Dr. Briggs said he had had them illustrated and catalogued for over 15 years; repeated and recent revisions of the catalogue had left them as they were, awaiting any more acceptable advance in histology.—Dr. AMAND ROUTH asked how Dr. Spencer proposed to decide whether the removed tumour was malignant or benign at the time of operation, and what course he would now pursue as regards the second ovary if he decided that the one removed was carcinomatous?—In reply Dr. SPENCER said he saw no evidence that the tumour was an endothelioma; structurally it was a typical medullary carcinoma, and it did not resemble microscopically the endothelioma he had met with in a dermoid. In reply to Dr. Routh's question, he thought in the case of such a soft tumour as the one shown (which in the fresh state resembled a spleen), it would be difficult to cut satisfactory rapid sections at the time of operation. He had not yet decided whether the tumour was malignant or benign, but had made a suggestion on that point in his paper. A similar case he would treat similarly. If the ovary, apparently normal at the time of operation, grew subsequently, he would remove it, but with very little hope that malignant disease affecting both ovaries would not recur.

Mr. GORDON LEY (for Dr. RUSSELL ANDREWS) read a short communication on Squamous-celled Carcinoma occurring in a Cystic Teratoma of the Ovary.

Dr. R. D. MAXWELL read a short communication on Inversion of the Uterus, (1) Acute, (2) Chronic.—The subject was discussed by the PRESIDENT, Dr. J. P. HEDLEY, Dr. ROUTH, Dr. BRIGGS, Dr. SPENCER, Dr. E. L. HOLLAND, Dr. COMYNS BERKELEY, Dr. T. G. STEVENS, and Dr. G. F. BLACKER.

Mr. GORDON LEY demonstrated a Fibroid of the Uterus, showing Invasion by Tubercle.—The specimen was remarked upon by the PRESIDENT, Dr. STEVENS, and Dr. LOCKYER.

The PRESIDENT showed an example of the "Bowel Pack," suggested by Mr. J. L. Aymard, of Johannesburg, in THE LANCET of Jan. 16th, p. 150, which he had made, and found that it answered the purpose well. It is made by coiling fine wire on to a pad of "cellular" cloth, the wire being sewn by a running stitch along its whole length. The wire he used was No. 22 gauge pure tin fuse wire, and was covered in by a single layer of lint sewn on to the pad.

When one of appropriate size is placed in position it keeps the bowels out of the way of the area of operation, and is a valuable improvement on the ordinary pad. It could be bent into any shape without injury.—Remarks followed by Dr. COMYNS BERKELEY, Dr. J. S. FAIRBAIRN, Dr. MAXWELL, and Dr. SPENCER.

CLINICAL SECTION.

Exhibition of Clinical Cases.—So-called Frost-bite.

A MEETING of this section was held on Feb. 12th, Mr. J. CHARTERS SYMONDS, the President, being in the chair.

Dr. JAMES GALLOWAY showed a case of Splenomegalic Anæmia. The patient, a boy aged 8½, had been observed by his mother to have a slight swelling of the abdomen 18 months ago. This enlargement had increased. He was said to have had an attack of jaundice about 15 months ago; his complexion was said to have become paler, and a year ago a severe epistaxis occurred. There had been an eruption of small purpuric spots and an attack of hæmatemesis a few days before he was admitted to hospital in November, 1914. Since that date he had been under constant observation. At first his condition became worse and another attack of hæmatemesis with copious melæna occurred. The lad was pallid and had a slight degree of protrusion of the abdomen; the spleen was markedly enlarged, reaching the level of the umbilicus; the lower edge of the liver could be felt below the costal margin, and this organ apparently extended higher in the abdomen than normal; probably it was enlarged. The blood had been frequently examined and the following report was characteristic. Red blood, fragility normal. Wassermann negative. Rouleaux and fibrin formation fair. Red blood corpuscles, 2,900,000 per c.mm.; hæmoglobin, 30 per cent.; colour index, 0·5; white blood cells, 840 per c.mm.; polymorphonuclear leucocytes, 57·5 per cent.; small lymphocytes, 35·0 per cent.; large lymphocytes, 1·5 per cent.; eosinophiles, 1·5 per cent.; basophiles, 1·0 per cent.; large hyaline, 3·5 per cent. There was no history indicative of syphilis. The father and mother appeared to be healthy. There were three sisters and one brother who were in good health. An uncle on the father's side had hæmatemesis associated with a swollen abdomen, but had recovered his health. An uncle on the mother's side had been treated for hæmatemesis and ascites. The question of removal of the spleen arose.

Mr. H. MORRISTON DAVIES showed the following cases: 1. A case of Mediastinal Teratoma. The patient, a man aged 21, was admitted to hospital in March, 1913. Six weeks previously he had noticed a swelling over the upper part of the left chest, which increased rapidly in size and became red and painful. He was admitted to an infirmary with a temperature of 104·8° F. The swelling was incised through the third space and pus escaped. It was noticed that the pus was of a peculiar consistency. A few days later, as there was no improvement in the patient's condition, another opening was made in the anterior axillary line, portions of the fourth rib being excised. The general condition became worse, and there was expectoration of large quantities of offensive sputum. Some hairs were found in the discharge from the wound, and the condition was recognised as an infected dermoid. He was then transferred to Mr. Davies's care, extremely emaciated, and in a condition of profound toxæmia. His temperature fluctuated between 102° and 104°. The skin around the opening was excoriated, and there was slight bulging of the surrounding chest wall. There was a copious discharge of pus, sebaceous material, and occasionally hairs. The heart was displaced to the right, and cough was accompanied by offensive expectoration. Under local anæsthesia the third left costal cartilage was removed, and the finger-like processes of the teratoma could be seen. A cavity was found extending inwards to the right of the sternum, outwards to the anterior axillary line, downwards to the fourth space, and upwards to under the first cartilages on both sides. A week later, as drainage was inadequate, portions of the third and fourth left ribs were removed under open ether anæsthesia. The patient suffered very greatly from shock, but improved slightly during the succeeding weeks. After two months the left second costal cartilage was removed, the second and third right costal cartilages were divided, and the upper part of the body of the sternum was excised. After another month the teratoma was partially separated from the pericardium. Two months later further attachments were divided so as to give better drainage. These operations were done under chloroform anæsthesia, and were followed by great shock. The patient improved, and cough and expectoration ceased. Subsequently the projecting portions of the teratoma were on five occasions excised under anæsthesia by gas and oxygen. In June, 1914, Mr. Davies began to separate the main mass of the teratoma from its attachments to the pericardium, aorta, and surrounding structures; it required five operations before the mass was excised. This part of the growth, half of which was exhibited, measured 13 cm. by 8 cm. by 7·2 cm. It contained, in addition to stratified epithelium, hairs, sebaceous matter, mucous follicles, cartilage and bone, cysts containing mucus, and lined by ciliated columnar epithelium. A further portion was treated in the same way and excised in November, 1914; this measured 7 cm. by 5 cm. by 4 cm. Very little of the teratoma remained. The granulations over the pericardium and other structures were becoming rapidly covered with epithelium, and the cavity from which the teratoma was removed had become obliterated to a great extent, partly by the mediastinum and partly by the expansion of the lung. 2. A case of Bronchiectasis treated by Ligature of Branch of Pulmonary Artery. The patient, a youth aged 17, was admitted to hospital in May, 1913. Seven years ago he had a severe attack of bronchitis, from which he never "properly recovered." During the previous year his cough was much worse and he expectorated large quantities of offensive sputum. Physical signs consisted of dulness, weak breath sounds, and coarse râles over the right base. The sputum contained many different forms of organisms, including streptothrices. Early in June the lung was completely displaced by nitrogen, and four days later the right side of the chest was opened through the fourth intercostal space and portions of the fourth and fifth ribs removed. The branch of the pulmonary artery going to the lower lobe was then tied at the root of the lobe. The patient was anæsthetised by infusion of ether and the lung was kept partially expanded by Mr. Davies's hyperatmospheric apparatus. As soon as the chest was opened the vagus was injected immediately above the hilum of the lung with 2 per cent. of novocaine. The patient experienced practically no shock after the operation. The temperature rose on the third day and 24 oz. of clear fluid were aspirated from the right side of the chest. A week later the temperature was still up, and turbid fluid, which contained streptococci, was found in the pleural cavity. This was drained through an opening in the incision. After three days, as the discharge and sputum were now offensive, a counter-opening was made behind through the ninth rib under local anæsthesia. From this time recovery was uneventful. By August the sputum was reduced to about ½ dr. only per diem and a small sinus was present; he was discharged to a home. The patient had since been working for many months. He said that he felt perfectly well and only occasionally coughed (two or three times a week). A skiagram taken at the beginning of last year showed a shadow at the base of the lung, but in one taken this year the shadow had greatly diminished, and the diaphragm was visible for the first time since he came under Mr. Davies's care. 3. A case of Bronchiectasis treated by Rib Mobilisation (Wilm's operation). The patient, a girl aged 15, deaf and dumb, was admitted to hospital in September, 1913, with extensive bronchiectasis involving the whole of the right side. Over the left base the percussion note was impaired; the breath sounds were harsh; expiration was prolonged and there were moist sounds. Nitrogen displacement was tried, but failed, owing to adhesions. Portions of the first nine ribs were removed through a posterior incision. Ten days later the second stage of the operation was done, the first to the seventh costal cartilages, including the costal margin, being cut away. There was slight shock after each operation. The patient's general condition had much improved. The cough and sputum were greatly diminished, and the latter was no longer offensive. The patient, who previously was often drowsy and apathetic, had become a bright girl and able to go out to work for the whole of each day. 4. A case of Osteitis Fibrosa Cystica. The patient, a girl aged 14, fell on her left hip 18 months ago. Pain was slight and passed off in the course of the day. In March, 1914, she again fell on her hip, and since then she had had occasional slight pain and had limped continuously. She

was seen in April, and a skiagram then taken showed a condition of affairs very similar to that which could be seen in one taken this month. There were very slight limitation of flexion, more of extension, some limitation of abduction and adduction, marked limitation of internal rotation, but none of external rotation. The range of movement in this direction was, however, not increased. There was shortening of the limb, and the great trochanter was raised to above Nélaton's line to an extent practically corresponding with the shortening. Thickening at the upper end of the shaft and of the neck of the femur could be felt. The skiagram showed curvature and enlargement of the upper end of the shaft and of the neck of the femur; the bone was expanded and the cystic condition and septa were easily seen. The epiphysis of the great trochanter was unaffected. The only alteration since April was a slight increase in expansion of the outer aspect of the bone.

Mr. STANLEY BOYD exhibited a case, similar to that last shown by Mr. Davies, in a girl aged 12. There was expansion of the upper end of the left femur, and a skiagram showed a central translucent area and also a fissure. There had been pain in the upper part of the femur for which the child had been kept in bed. After going out she had been knocked down by a boy while at play, when the fissure had been produced. At an operation, tissue was removed from within the swelling, which looked like the growing edge of sarcomatous growth, but which microscopically proved to be connective tissue undergoing ossification. Since then the translucency had become almost normal, and the child ran about free from pain or discomfort.

Mr. R. H. JOCELYN SWAN read a short paper on So-called Frost-bite, based on 100 cases among soldiers returned from the front, 80 of whom had been under his care at the Royal Herbert Hospital, Woolwich. The only causal condition common to all was continuous standing with wet feet. There were two distinct groups of cases: (1) Those in which there was little destructive change, but marked subjective symptoms were present; and (2) those in which there was gangrene of various amounts from a superficial skin lesion to that in which one or more toes were destroyed. In the first group there were cutaneous anæsthesia and analgesia. Joint sense and vibration sense might be lost. Patchy hyperæsthesia was sometimes present, and there was pain on movement or pressure. He regarded the condition as resulting from nutritional change and not as a neurosis, which had been suggested by some. With respect to the second group the gangrene was often greatest in the great toe, and the majority were examples of dry gangrene. It was more usual for one foot to be affected, but there was no ready explanation as to why this should be so. The gangrene had no relation to points of pressure. He thought that the condition was attributable to the dependent position of the feet, to wet, and to want of exercise, and not to cold. Canadian officers had told him that the condition was quite unlike that of true frost-bite with which they were familiar. As preventive measures he suggested the wearing of a thin mackintosh covering outside the sock, but inside the puttee, and the free use of vaseline or whale oil to protect against the wet, and that the boots should be large enough to allow of free movement of the toes. The men should be instructed to carry out this movement.—Dr. GALLOWAY likened this condition to thrombotic phlebo-arteritis obliterans.—Dr. E. G. FEARNSIDES said that the cases could be classified into three groups: (1) Those with objective signs with perhaps some sensory loss, but without subjective symptoms; (2) an intermediate group with slight alteration of sensation, showing blunting of sensation, but without anæsthesia, and a band of hyperæsthesia at the upper border of the affected area; and (3) those in which sensation was lost over an area of the stocking type, which in ordinary civil practice would be ascribed to neurosis. In the Balkan War it had been agreed that the objective changes were vascular in origin.

LARYNGOLOGICAL SECTION.

After-treatment of Submucous Resection of the Nasal Septum without Splints.—Exhibition of Cases and Specimens.

A MEETING of this section was held on Feb. 5th, Dr. WILLIAM HILL, the President, being in the chair.

Sir WILLIAM MILLIGAN read a note on the After-treatment of Submucous Resection of the Nasal Septum without Splints. Having used Whitehead's varnish for painting between the perichondrial flaps and stitches and varnish for the line of incision for several years, he concludes that there is less discomfort and better drainage than after packing the nose. The after-results have been good, and there has been no hæmorrhage or hæmatoma of the septum.—Dr. P. WATSON-WILLIAMS said that packing the nose might cause serious disadvantages, as in cases of sinusitis.—Sir STCLAIR THOMSON agreed, but stated that in simple cases his practice had been to replace the whole of the septum in small pieces and to pack the nose with sponge tissues so that the parts remained in position.

The following cases and specimens were shown:—

Sir WILLIAM MILLIGAN: A woman, aged 30, with Chronic Lymphangitis of the Nose commencing three years earlier.—Dr. WATSON-WILLIAMS had seen similar cases with latent sinusitis.—Mr. H. TILLEY suggested a blood culture for vaccine treatment.—Dr. BROECKART had obtained excellent results by excision of the hypertrophied tissues.

Mr. E. D. D. DAVIS: 1. A boy, aged 14, from whom he had completely enucleated a large Nasopharyngeal Fibroma with a strong dissector and the finger without splitting the palate under intratracheal ether. 2. Three post-mortem specimens illustrating Diseases of the Pituitary Body treated by Killian-Hirsch operations.—The PRESIDENT referred to the dangers of these operations.—Mr. W. G. HOWARTH said that it was important to distinguish the cases in which the disease was below the sella turcica from interpeduncular and pontine tumours. The latter were generally fatal.

Dr. W. H. KELSON: A man suffering from Laryngeal Obstruction following acquired specific disease. The larynx showed fleshy masses resembling pachydermia.

Mr. W. M. MOLLISON: A patient with Traumatic Fixation of the Right Vocal Cord and Displacement of the Right Arytenoid Cartilage. He had been operated on ten years back for goitre. Such a condition was common after goitre operations; sometimes the lesion was caused by pressure of the thyroid gland and antedated the operation.

Mr. W. STUART-LOW: 1. A man with Dyspnœa caused by Tracheal Compression. Skiagrams of the chest (exhibited) showed a definite shadow, but there was doubt whether this was caused by aneurysm or mediastinal tumour.—Dr. KELSON suggested the possibility of a syphilitic mass. 2. A patient with Epithelioma of the Pharynx and Tongue treated by Diathermy. The glands of the neck had also been punctured with the cautery with marked improvement.

Mr. C. I. GRAHAM: A similar case to the foregoing after operation and dissection of the neck.

Dr. JOBSON HORNE: An Epithelioma of the Tonsil in a woman aged 43.

Mr. H. L. WHALE: A circular piece of tin 1¾ inches in diameter, bent and jagged, removed from the gullet of a soldier by œsophagotomy. Recovery was uneventful.

Mr. C. W. M. HOPE, Mr. H. BUCKLAND JONES, and Dr. JOBSON HORNE: Soldiers who had had Gunshot Wounds of the Larynx or Pharynx.

Dr. DAN MCKENZIE: A patient with Synechiæ of the Nose treated by Diathermy with excellent result.

Mr. TILLEY: Three children of the ages of 7, 8, and 10 years, who had had Acute Suppuration of the Nasal Accessory Sinuses. Complete recovery followed operation in all cases.

Mr. GRAHAM: A patient with Tuberculosis of the Nasal Fossæ, and sections of the tissue containing tubercle bacilli stained *in situ*.

Sir STCLAIR THOMSON produced a report by Professor Shattock on his specimen of Laryngeal Growth, exhibited in December, 1914, stating that the disease was early squamous-cell carcinoma.

Dr. JOBSON HORNE demonstrated microscopical sections of Pachydermia of the Larynx.

MEDICAL SOCIETY OF LONDON.

Discussion on Gunshot Wounds of the Head.

A MEETING of this society was held on Feb. 8th, Sir JOHN BLAND-SUTTON, the President, being in the chair.

Sir VICTOR HORSLEY opened a discussion on Gunshot Wounds of the Head. His paper is published on page 359 of this issue.

Sir DAVID FERRIER said that were it not for the President's express invitation he would not have ventured to take part in the discussion, for he had little or no experience of

the immediate effects of gunshot wounds of the head. He would like, however, to express his high appreciation of the admirable exposition which Sir Victor Horsley had given of the mechanism of this class of injuries. His own experience was limited to the after-effects of gunshot wounds of the head in the form of permanent lesions of different parts of the brain. These did not differ from the effects of lesions caused by disease or other forms of injury, and corresponded in their symptomatology with the position of the lesion according to the recognised principles of cerebral localisation. Thus there might be met with hemiplegia, or monoplegia of different types; aphasia, motor or sensory; affections of vision, hemiopic or quadrantic; as well as a notable absence of either sensory or motor impairment in cases of lesions of the frontal lobes or other so-called "silent" areas. It was astonishing what extensive lesions of the brain were compatible with a fair degree of both mental and physical health. One of the frequent and distressing effects of lesions of the motor area was the liability—apart from the monoplegia or hemiplegia—to Jacksonian epilepsy conditioned, without doubt, by the septic character of the lesion, and the tendency of this epilepsy to persist, even after repeated operations with a view to removal of the irritative focus. Sir Victor Horsley was well acquainted with a case of this kind—an officer wounded in the Boer War, who was still hemiplegic and epileptic after a severe wound of the left motor area, though he had been operated upon on several occasions since that time. In regard to the immediately or rapidly fatal effects of gunshot wounds of the head it was not the result of the cerebral lesion as such (provided it was not in the medulla oblongata), but, as Sir Victor Horsley and Dr. Kramer had shown, of the hydrodynamic effect of the passage of bullets of high velocity through the incompressible semifluid contents of the cranium. This caused compression or compression with effusion, and consequent paralysis of the vital centres of the medulla oblongata. The primary cause of death, as Sir Victor Horsley and Dr. Kramer had shown, was paralysis of the respiratory centre. Cushing was of opinion that the cessation of respiration is secondary to vaso-motor paralysis, but the experiments of Dixon and Halliburton had amply confirmed those of Horsley and Kramer. They had found that when the pressure of the cerebro-spinal fluid is artificially raised by the injection of saline into the subcerebellar cistern, the respiratory centre fails before either the cardiac or vaso-motor centres, and that death occurs unless artificial respiration is kept up. This had an important bearing on treatment. Sir Victor Horsley had pointed out that in certain cases death might be warded off by timely artificial respiration. This, of course, would only be available in cases in which there was no intracranial effusion. But it might be possible that with artificial respiration and free opening of the skull to relieve the intracranial tension, life might be saved. Perhaps some of the surgeons at the front, when they read of the proceedings of that evening, might be induced to resort to such treatment when appropriate occasions arose.

Mr. RICHARD WARREN said that the cases on which his contribution to this discussion was based were met with partly in civil and military practice in England, but more in the service of the Belgian Field Hospital at Furnes, where he had had the opportunity of seeing patients within a few minutes of injury (from bombardment of the town), or within a few hours at the outside (when brought in from the firing line a distance of five or six miles). The subject was therefore being regarded rather from the point of view of immediate results than of the more remote effects, which also formed so important a part of the surgery of the cranium and its contents. The cases met with fell into two groups. Group 1. Injuries of the cranium with little or no effect on the brain. These were for the most part trifling, but might present points of interest as in the following case, which was sent to him by Dr. A. Craster. A Belgian, aged 29, had been struck by a shrapnel ball three weeks before in the right temporal region. There was a small well-healed scar in this region, not obviously inflamed, but the seat of intense pain and agonisingly tender on palpation. The pulse was 80, the temperature slightly subnormal, and no other signs of intracranial trouble were present. A flap was turned down, including the scar; the tissues were found to be matted and stained with lead, and the pericranium was infiltrated and separated more readily than normally from the skull. Thinking that there might be some inflammatory collection below the skull he trephined, but found the subcranial space and dura normal, nor were there any spicules of bone from a concealed fracture. The scar and thickened periosteum were cut away and the patient made an uninterrupted recovery with complete relief of symptoms. Group 2. Cases where the skull was fractured, whether in the form of a punctured fracture or one widely open and depressed. In most cases of this sort the dura was penetrated and the brain lacerated to a varying degree whereby these military cases differed from a large number of those met with in civil practice in which the dura remained intact and the prospect of infective meningitis was much less. As regards fractures of the skull, puncture fractures were more often the result of bullet or shrapnel wounds, whilst the bursting of common shell was more prone to cause a widely open depressed fracture. Nevertheless, the last result might follow the impact of a bullet, as was shown in the following case. A bullet entered the left orbit in a lateral direction and completely scooped out both eyes, the nasal fossæ, and a good part of the floor of the anterior fossa of the skull, with the result that there was much brain exuding into the widely opened nasopharynx. In spite of the severity of the lesion this patient was doing well six days later, when he had to be evacuated owing to the town being shelled. The main dangers from injuries of this type were primarily from the shattering of, or pressure by effused blood, &c., on some vital part of the brain and later from the onset of meningitis, which was relatively common, since the dura was practically always opened. The widely opened fractures were also dangerous from the effects of contre-coup on parts of the brain other than that immediately concerned in the fracture. It had long been recognised that the anterior part of the brain could be grossly damaged with but little immediate ill-effects, and he had been a good deal struck by the relative well-being of such patients. For example, one patient arrived with a large depressed fracture of the right frontal bone (the result of a shrapnel burst) and a corresponding black eye like an over-ripe tomato, and yet he was quite conscious, calm, and with but little shock. There could be little doubt that when the skull was shattered the force of concussion was thus in many instances broken and the brain as a whole saved from severe and possibly fatal shaking. In other cases of this nature, however, there was widespread pulping of the brain and death was rapid. The danger from meningitis once the dura was opened (as was the rule in these cases) was considerable, both in the punctured and widely open variety; still, a number of cases, even where a large amount of brain had prolapsed, escaped this complication in anything more than a local degree, and the large fungating hernia cerebri ultimately contracted and healed over. As regarded treatment, the main points seemed to be to render the parts affected as aseptic as possible, for which purpose the weak alcoholic solution of iodine was well adapted. The second point was to render the openings in the skull (where the latter was penetrated) sufficiently large to avoid compression, which might follow the swelling of the necessarily inflamed brain, and, at the same time, to remove foreign bodies which might promote sepsis. This was often a simple matter in the case of shell wounds with wide openings, as the loose fragments of skull could be readily picked off and the rough edges of the aperture smoothed with rongeur forceps. The smaller holes caused by bullets were more likely to require an opening with the trephine to afford due access. Another point to be considered was the advisability of searching for bullets, bits of skull, &c. This should be done at once by searching carefully along the track of the penetrating object with a large blunt probe the size of a No. 10 catheter in the case of small wounds caused by bullets, or with the sterile finger in large lacerations. With a large blunt instrument it was not difficult to keep on the track of the foreign body and avoid further injury, whilst the removal of bullets, pieces of skull, &c., would diminish the risk, at a later date, of infective meningitis and encephalitis. Note should, of course, be taken of wounds of exit where the bullet had completely traversed the head, as finding such clues would render prolonged searching for bullets unnecessary. When possible, radiographic assistance was valuable, but under the emergencies of active service it

was often necessary to rely on the large probe or finger. If no bullet could be found after a brief but thorough search one should desist, and later, should the patient survive, accurate estimation should be made by means of radiograms of the position of the bullet or fragment of shell, when, if in an accessible position, it would as a rule be sound policy to attempt its removal. The mortality of the cases with depressed fractures and lacerated brain was undoubtedly heavy, but he could not help being struck with the powers of recovery shown in many instances and regarded with some degree of hope even very extensive injuries of the brain, provided that these affected the more superficial parts of the organ.

Mr. W. H. H. JESSOP called attention to the frequent occurrence of papilloedema after fractures of the vault by bullet and shrapnel, and to the rapid disappearance of it after decompression or trephining. Mr. M. W. B. Oliver had told him that in 30 cases of vault fracture he had observed the condition in 16 cases, and that in every case the ocular signs had disappeared quickly after operation. The swelling of the optic discs was not great, and as a rule there were no hæmorrhages or effusion along the vessels; there was a ring of œdema round the periphery of the swollen disc. The vision was normal or little affected. The early occurrence and complete disappearance of the ocular signs on relief of intracranial pressure pointed to the papill-œdema being due to pressure. The term "optic neuritis" ought not to be used for these cases. Two very interesting cases he had seen at No. 1 Base Hospital. One, under Mr. W. D. Harmer, was due to shrapnel wound on the side of the head; the patient was at first completely blind and deaf. After 36 hours the complete blindness was followed by homonymous hemianopsia. The central vision in each eye became normal after operation, and the deafness also was recovered from. The other patient, under Mr. McAdam Eccles and Mr. G. E. Gask, had complete paralysis of the third, fourth, and ophthalmic division of the fifth nerves; the optic disc and vessels were normal, and the vision and fields of vision also normal. The X ray photographs showed six small pieces of shrapnel lying close together near the cavernous sinus. No changes had taken place after six weeks.

Major L. BATHE RAWLING, R.A.M.C.(T.), said that the few remarks which he had to make must necessarily be related to such cases of head injury as were seen after their admission into military hospitals in this country, of men wounded from anything from three days to three weeks previous to admission here. However, so far as he could see, there was less change in surgeons' views as to the correct surgical attitude in this particular branch of surgery than in some others. For example, they had had to alter somewhat their ideas as to fractures of the long bones, more especially in the event of the injury being compound and associated with prolonged suppuration, kept up by the presence of many loose fragments of bone, with perhaps some additional foreign body. Early and extensive operations conducted for the removal of such sources of irritation had not been followed by the success anticipated. Surgery of fractures of the long bones had become rather conservative. With regard to head injuries, however, his experience had been such that he was more than ever convinced that operative interference should be carried out at the earliest possible moment, not necessarily at the field hospital, where conveniences might be wanting, but certainly at the base hospitals in France, and if not there, as soon after their admission into hospital in this country as was possible. Such methods of treatment had been advocated by Bowlby, Makins, Spencer, and others in the South African War, by Lawford Knaggs and himself in this country, and by many others. In his book on the "Surgery of the Skull and Brain," published in 1912, the following statement occurred: "It is accepted that all bullet wounds of the skull and brain call for early operative interference, it being granted that the condition of the patient is compatible with such treatment." In other words, that all cases, unless hopelessly bad, should be operated on as soon as possible. He was convinced that this interpretation was correct, and he could not understand the attitude of those surgeons who advocated and carried out an expectant form of treatment. He had had the opportunity of observing the conditions associated with, and arising from, both varieties of treatment. There was no comparison between the results obtained. The expectant treatment was followed by a much higher rate of mortality and, in addition, in those patients who recovered without operation, the presence of depressed bone, blood clot in relation to the membranes and brain, and foreign body would certainly assist in the development of those remote effects of head injury which were so well known, of such frequent occurrence, and so difficult to remedy. Consequently, from his general experience of head injuries and from that derived from cases under his care at the 1st London General Hospital, he advocated most strongly early operative interference. This consisted (1) in the treatment of the wound of entry or attempted entry; and (2) in the removal of the foreign body. The presence of a foreign body, whether embedded deeply in the brain or not, might be determined with reasonable certainty by investigating the exact nature of the wound, whether direct, glancing, &c., though, so far as his experience went, the absence of foreign body in the brain was the exception rather than the rule. In all cases, however, X ray pictures should be taken before the operation, stereoscopic if possible. Such pictures would not only show the position of rifle bullets, shrapnel bullets, or casing, &c., but would also afford direct evidence as to the presence and position of depressed and in-driven fragments of bone. The fact that nearly all serious cases of head injury were septic, like so many other wounds that came from the front, merely strengthened his argument for early operation. The prolongation of suppuration was dependent on the presence of these depressed fragments and foreign bodies, and it would continue so long as these were allowed to remain, with the consequent daily threatening of brain abscess, hernia cerebri, and meningitis. So far as actual technique was concerned, the head should be shaved completely—a process that might require the use of several razors, the hair being matted with dirt, sand, and blood. The head should then be washed thoroughly with scrubbing brush and soap, dried, and painted over with iodine. When this had been done the scalp tourniquet should be applied, for it was important that the loss of blood from scalp vessels should be controlled efficiently. The scalp wound should then be enlarged freely in the required directions, the flaps thrown back, their edges touched up with pure carbolic acid, and their under surface with iodine. The condition of the bone could then be investigated. Fractures limited to the external or internal tables were rather more of text-book prominence than of actual occurrence, and it was necessary in practically all cases to trephine or remove loose fragments of bone in such a manner as to expose freely the underlying dura mater and brain. Depressed fragments should be elevated, small loose fragments of bone picked away, and larger fragments treated in a similar manner or thrown back if they retained any direct connexion with scalp or pericranium. In any case it was advisable to obtain a good view of the dura mater, and the surgeon should err on the side of removing too much bone rather than too little. Blood clot, derived from torn meningeal vessels or from the diploic tissue, should be wiped away and bleeding controlled, dural vessels being under-run and diploic foramina blocked with wax. With a dry field, the dura now remained for inspection. If uninjured, the scalp wound might be approximated, with free and efficient drainage. If torn, the dura should be slit up and a careful investigation carried out for fragments of bone or foreign body, all of which might be carried deeply and widely throughout the underlying brain substance. All such loose fragments must be gently picked away, with all respect to the surrounding brain substance. During this procedure a stream of saline solution at a temperature between 110° and 115° F. would help to keep a clean field, washing away blood, brain, débris, &c. The ordinary probe would assist in the detection of such foreign bodies, and the telephone probe in the presence of metallic substances. Personally he had tried the telephone probe on several cases previously to the war, that pattern being utilised which had been invented by Sheen and described in 1905, and which had been improved recently. He must confess, however, that he was not enamoured of the telephone probe; the presence of any foreign body could be detected with the ordinary probe with almost equal facility, and it mattered not whether the foreign body was osseous or metallic—it must be removed. Though of opinion that a considerable area of bone might require to be removed in the investigation of the injury, he thought that one should be much more judicious in the search for the foreign body in the brain. Needless probing

could only do harm, and unless the foreign body was detected with ease it was preferable to wait, further skiagrams being taken to investigate its exact position, and a second operation being performed later. The position of a bullet might demand that the exploration should be carried out over an area distinct from that of the entry of the bullet. Drainage must always be of the most efficient type, even to leaving a considerable area of brain exposed to the surface. No perforating wounds of the skull had come under his care—doubtless due to the fact that they were so frequently fatal in character. The more favourable cases were those in which the osseous and cerebral lesion occupied the frontal and temporo-sphenoidal regions. The more fatal lesions were situated in the posterior half of the skull, especially in the cerebellar region. He would suggest that after the lapse of a few years the society should hold an inquiry into the after-results of these head injuries. There would, he feared, be plenty of material, and he would add that he was sure that the material would be all the more plentiful if operative interference was inadequate or postponed and, more especially, if such methods were not carried out at all.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF STATE MEDICINE.

The Vaccination Acts.

A MEETING of this section was held on Jan. 8th. Dr. T. P. C. KIRKPATRICK, the President, from the chair, read a paper defining his position with regard to vaccination, and expressing his belief in its efficacy to prevent small-pox in those who were sufficiently often revaccinated. He gave a short synopsis of the history of vaccination in the United Kingdom. In spite of the various Acts, the proportion of the population protected from small-pox by vaccination was steadily diminishing, and showed a tendency to diminish more rapidly in the future. He thought that it would be impossible either to make the compulsory clauses of the Vaccination Acts more stringent or to compel persons to be revaccinated, and under these circumstances vaccination would afford an unreliable protection from outbreaks of small-pox. The experience of Leicester gave hope that such protection might be afforded by good sanitation. Something should be done at once to meet the growing danger of epidemic small-pox.

Dr. NINIAN FALKINER considered vaccination necessary for the protection of the population. Referring to the last Act mentioned in the paper—the Act of 1907—the year 1905 might be taken as the maximum of protection by vaccination in England, Wales, Scotland, and Ireland. At that time the percentage of the population vaccinated in the different countries was: England and Wales, 76 per cent.; Scotland, 85 per cent.; and Ireland, 82 per cent. The figures for the year 1911 (four years after the passing of the Act) were: England and Wales, 52 per cent.; Scotland, 58 per cent.; and Ireland, 73 per cent.; and when the figures for 1913 were available it was expected that a further decline would be shown in the number of those vaccinated. The percentage of conscientious objectors in England and Wales had increased from 8·4 per cent. to 28·4 per cent., and in Scotland from 5·6 per cent. to 24 per cent.

Sir JOHN MOORE referred to the perfunctory enforcement of the Notification Act in Ireland. He looked upon it as a farce. He was quite sure that sanitation would not afford any protection against small-pox in Ireland so long as there were no medical superintendent officers of health except in Dublin, Belfast, Cork, and Londonderry. He quoted Dr. C. K. Millard, whom he looked upon as sitting on the fence—"I am prepared to admit that a universal system of vaccination and revaccination, if effectively carried out, would abolish small-pox." What was wanted, Sir John Moore suggested, was a Minister of Public Health. The Local Government Board in Ireland were complaining that the Vaccination Acts were not being enforced, and instead of getting a mandamus against the guardians whose duty it was to enforce these Acts they approached the corporation of Dublin and pointed out the necessity of providing extra hospital accommodation for expected cases of small-pox. He suggested that the most practical and effective protection against small-pox was to be found in aseptic primary vaccination, aseptic secondary vaccination, and, of course, sanitation in the fullest sense of the term.

Dr. R. J. ROWLETTE said that Sir John Moore had told them the best methods for preventing small-pox, and he (Dr. Rowlette) was in thorough agreement with him; but the immediate problem was how much of that programme was practical. He considered that the whole programme was not practical. He did not think, nor had Sir John Moore suggested, that revaccination could at present be made compulsory. As to the question of sanitation, he looked upon Ireland as without sanitation. There was only one whole-time medical officer in Ireland. No attempt was made by any section of the community to make sanitation more efficient in Ireland. The community paid certain medical men from £5 to £15 per annum to look after the health of a large district, which showed that the work was not taken seriously; on the other hand, vaccination had been taken seriously, and was fairly well done. Sanitation at the present time was impossible in Ireland, since no one seemed to think it was required, and whatever chance there was of carrying out primary vaccination there was no chance of sanitation.

The PRESIDENT, in reply, said it was now over a century since the medical profession had come to the conclusion that vaccination was the best preventive measure against small-pox. One must, however, consider the evidence. In any other matter it would come as a striking phenomenon to learn that a community which had abandoned a preventive measure found greater immunity than a community that had adopted that measure to the fullest extent. What had to be considered was what was going to be done in Ireland, since primary infant vaccination could not be relied upon and compulsory revaccination could not be got. As long as compulsory vaccination was relied upon the greatest lever which could be got for sanitary reform was lost. He held no brief for antivaccinationists, nor did he agree with them as to the alleged failure of vaccination to prevent small-pox.

ÆSCULAPIAN SOCIETY.—A meeting of this society was held in the Metropolitan Hospital on Feb. 5th, Dr. David Ross, a past President, being in the chair.—Mr. Peter Daniel read a paper on Colitis and its Treatment. Colitis, he said, is a mysterious condition much written about and little understood even by men who see cases post mortem. The name even is confusing, as it implies that the condition is confined to the colon, whereas in cases in which the colon has been removed mucus is still passed. A name describing the condition better would be gastro-enterocolitis. For working purposes a simple classification based on the nature of the discharge answers very well: (1) Colitis, with mucus discharge; and (2) colitis, with all other forms of discharge. Infantile diarrhœa, constipation, and other bowel trouble enter strongly into the causation of mucous colitis, but it is difficult as a rule to obtain a history of such conditions. In about 5 per cent. a history of typhoid fever is obtained. The history of spinal trouble, scarlet fever, sore-throat, diphtheria, whooping-cough, and mumps is also associated, but whether they have any bearing other than as causes of lowered resistance is difficult to say. Oral sepsis plays a strong part in the causation, and it is very rare indeed that a patient with mucous colitis gives a "clean history." In cases of primary (mucous) colitis, if the patient suffers from oral or naso-respiratory sepsis, they almost always develop into the ulcerative or necrotic varieties in consequence of swallowing strepto- and staphylococci. A marked condition in mucous colitis is the thinness and apparent elongation of the intestine, which permits looping and folding and is the effect and not the cause of the disease. The symptoms of colitis are so variable that it is impossible to state them in a small space. There are always pain and abdominal discomfort, and distension, coming on towards night. There is aversion to anything tight about the waist. Hot liquids increase the discomfort and probably cause a disinclination for food and nausea. The pain is unstable and hard to locate, and consequently leads frequently to errors of diagnosis. The only way to arrive at a correct diagnosis is by systematic investigation of the colon

by means of the sigmoidoscope and of the fæces by a pathologist. Physical examination of the abdomen alone is usually negative—often nothing being observed, at times tympanites exists, at others the colon may be felt contracted, especially the sigmoid. The temperature is usually normal or subnormal, and the pulse is slightly altered. The treatment may be medical or surgical. Medical consists of dieting, drugs, massage of the abdomen, and generally carried out over long periods; also hydrotherapy and lavage. Suggestion and suitably dealing with the mental state and despondency. The personality of the physician is a strong factor in the treatment. Castor oil relieves pain, as also does cascara combined with agar-agar; calomel in 1/10th gr. to 1/12th gr. doses two or three times a day is also recommended. If injections are required they should consist of olive oil introduced through a large nozzle carefully, the patient being on the left side at first and later in the genu-pectoral position. Surgical treatment mentioned was short circuiting, which has not proved very successful, appendicostomy for continual lavage, and excision of entire colon. Mr. Daniel spoke in favour of appendicostomy, or in the absence of the appendix of cæcostomy, with the object of perfect lavage. Lotions for this purpose might be normal saline, 5 per cent. glucose as the least irritating, but often chemical lotions must be used for the following reasons. In some cases 1½ or even 2 pints of saline is passed through the appendix; it distends the sigmoid but is not expelled spontaneously; sometimes gentle massage over the colon leads to its expulsion, but this sometimes fails. In some cases an astringent may be necessary; of these the mildest are hazeline, zinc sulphate, a few drops of formalin, or the smallest quantity of silver nitrate, either of which leads to spontaneous evacuation. When the solution is retained it leads to a certain amount of diuresis. As a rule the fluid is rapidly absorbed, but at times the absorption is slower. Mr. Daniel stated that on one occasion he passed the sigmoidoscope while the solution was retained and saw the sigmo-rectal sphincter tightly closed, but a very slight pressure from below relaxed it; then after a small enema of half a pint was used the colonic fluid was usually expelled. Some authorities believe that the non-irritating qualities of olive oil suit the mucosa, but he (Mr. Daniel) found that ol. paraffin liq. placed within the bowel after the saline and bowel contents have passed does more good.

ULSTER MEDICAL SOCIETY.—A meeting of this society was held in the Medical Institute, Belfast, on Feb. 11th. Mr. R. J. Johnstone opened a discussion on Cæsarean Section by reading a very interesting paper giving an analysis of 28 cases of this operation.—Sir Alexander Dempsey, Dr. John Campbell, Dr. G. A. Hicks, Dr. C. G. Lowry, and Dr. Elizabeth Bell took part in the discussion.

SANATORIUMS FOR TUBERCULOUS POOR IN SWITZERLAND.—Switzerland has during the last 15 years been making strenuous efforts to provide adequate sanatorium accommodation for the tuberculous poor. In 1913 not less than 14 sanatoriums with 1084 beds have been built to accommodate and treat 2722 patients, the average duration of the treatment being 132 days. Exact reports referring to 2377 tuberculous patients have just been published in the *Bulletin Sanitaire Suisse*. Of 788 patients in the first stage 97·5 per cent. and of 555 in the second stage 90·5 per cent. were improved, while of 571 patients in the third stage the percentage of improvement reached the number of only 59·7 per cent. It is to be hoped that from year to year fewer patients who have already reached the third stage will be recommended for admittance. 1357 patients, or 57 per cent., became able to resume their usual occupation; 580 (24·4 per cent.) were slightly, and 399 (16·8 per cent.) greatly, hindered in their working capacity. In 41 cases of those in the second and third stage death occurred. The society "Pro juventute" has collected £10,800 to combat the disease. Forty-four ladies' associations disseminated throughout Switzerland have been actively employed in the same service, and have done excellent work, especially in founding and maintaining a score of dispensaries for the tuberculous. The cantons of Lucerne and Grisons have each collected £12,000 to build a sanatorium of their own.

Reviews and Notices of Books.

Text-book of Embryology: Vol. I., Invertebrata. By E. W. MACBRIDE, M.A., D.Sc., LL.D., F.R.S., Professor of Zoology at the Imperial College of Science and Technology, South Kensington. Edited by WALTER HEAPE, M.A., F.R.S. London: Macmillan and Co., Limited. 1914. Pp. 692. Price 25*s.* net.

THIS is the first of three volumes intended to deal with the enormous subject of embryology. A second volume will be devoted to that of the lower vertebrata, and a third to that of mammals. In this handsome, well-printed, and superbly illustrated volume on invertebrate embryology the design is to associate the structural development of embryos with broad generalisations of what is known of their physiology—e.g., the correlation between the function of certain organs of a larva and its habits of life, and between function and habit in the course of development. Some results of experimental embryological research are included, while a novel feature is introduced whereby attention is directed to gaps in our knowledge, which indicate promising fields of research as well as the best means of attacking these problems.

The author regards the science of comparative embryology as a gold mine from which rich rewards have already been reaped, but of which only a small part has as yet been developed, and which promises abundance of gratifying surprises and rewarding returns to the worker of the future; but although the labourers are few, the enormous record of facts already disclosed shows that the harvest truly is plenteous, so plenteous indeed that we sincerely trust the editor's hope of stimulating the interest especially of students of medicine will be realised. We doubt, however, whether the average medical student would at once grasp the full significance of a sentence such as this taken at random: "In the oligochaeta the prototroch is never developed at all; the embryo develops into a blastula, which is converted into a gastrula by invagination or by epibole."

An introductory chapter extending to about 30 pages dealing with growth, maturation, and conjunction of germ cells, chromosomes and their bearing on heredity, the recapitulation theory, embryonic and larval phases of development and factors modifying development, is followed by a short account entitled "Practical Hints" as to methods of procedure applicable to all, or nearly all, classes of embryo. Special methods are described with each phylum. Then follow separate accounts of all phyla of the invertebrates from porifera to protochordata. Each phylum is treated with a wealth of descriptive detail and illustrated by means of admirable figures in the text. The 469 illustrations are drawn from many sources—some are original, many are composite, but all are superb and illuminating.

In his "summary" the author arrives at the far-reaching conclusion that in general the larval phase of development represents a former condition of the adults of the stock to which it belongs. This is in substance the recapitulatory theory, the so-called "law of biogenetics," to which the author adds his testimony, and in so doing gives a rational account of recapitulation. "The individual in its development recapitulates the development of the race." An interesting survey of the Lamarckian doctrine leads the author to discuss the part that

may be played by hormones in relation to the theory of inheritance of acquired characters.

In our opinion this work at once takes a place in the foremost rank of embryological studies. It will prove indispensable to all earnest students of zoology. It is dedicated to the memory of his teacher and friend Adam Sedgwick, and is a worthy tribute of a devoted pupil to a beloved and inspiring master.

Manual of Obstetrics.

By EDWARD P. DAVIS, A.M., M.D., Professor of Obstetrics in the Jefferson Medical College, Philadelphia. With 171 illustrations. London and Philadelphia: W. B. Saunders Company. 1914. Pp. 463. Price 10*s.* 6*d.* net.

THIS book is dedicated to the students and graduates of the Jefferson Medical College, and is interesting as embodying the teaching of a well-known American obstetrician. It contains a great deal of useful and accurate information on the subject of obstetrics, but there are a number of statements made and methods of treatment described which are hardly in conformity with the teaching on this subject in this country. We are told, for example, that the "placental sound" is usually produced in the large uterine sinuses where the placenta is attached, and that the funic souffle is a hissing, rapid sound, a little slower than the fœtal heart and more rapid than the placental sound. The delivery of the crushed head by cranioclasm would mean to the English student the preliminary breaking up and removal of the vault of the skull, but Professor Davis employs the term for the operation of removal of the head by the craniotomy forceps after perforation without previous crushing. The statement that cephalotripsy may be performed upon the unperforated head is not a usual one in modern text-books. The maternal mortality from placenta prævia is more commonly quoted as 5–10 per cent. in most English text-books, rather than the 10–20 per cent. at which it is estimated by the author.

In the section on eclampsia the sentence that "when the resisting power of the patient is greater Nature may endeavour to save her life by producing convulsions" is an odd one, and we are surprised to find that Sellheim's proposal to amputate the breasts for eclampsia is quoted without any condemnation. The statement that when, after the rupture of an ovarian, tubal, cornual, or broad ligament pregnancy, the ovum, having passed upwards into the abdominal cavity, it may engraft itself upon the surrounding omentum, mesentery, peritoneum, or bowel, and gradually develop a placenta and membranes, is misleading and inaccurate. The description of abdominal pregnancy is poor; no attempt is made to distinguish between primary and secondary abdominal pregnancy; nothing is said about the anterior or posterior subperitoneal varieties, and Taylor's important work on this subject is not even referred to. It is difficult to believe that the author would really practise vaginal hysterectomy in the event of a retroverted uterus remaining in the hollow of the sacrum and infection developing after the death of the embryo; why not remove the cause in the shape of the dead and no doubt putrefying embryo?

The legends of some of the figures show a want of care. Thus, "The Fœtal Heart Sounds" is the title given to a picture representing auscultation of the pregnant uterus; "The external conjugate by external pelvimetry," Farabœuf for Farabeuf, and such an expression as "The Infection of the Baccillus Coli Communis," are slips such as one does not expect to find in a book of this kind.

Notwithstanding its defects, however, the book is worth reading as exemplifying the teaching and practice of an American obstetrician.

Butterworth's Workmen's Compensation Cases.

Vol. VII. (New Series). Edited by His Honour Judge RUEGG, K.C., and DOUGLAS KNOCKER, Barrister-at-Law, M.B. Lond., M.R.C.S. Eng., L.R.C.P. Lond., D.P.H., assisted by EDGAR T. DALE, Barrister-at-Law. London: Butterworth and Co. 1914. Pp. lxix. + 1011 + 28. Price 12*s.* 6*d.* net.

THIS annual volume contains reports of all cases decided from October, 1913, to October, 1914, under the Workmen's Compensation Acts in the House of Lords and Court of Appeal, England, and selected cases from the Irish Court of Appeal and Scotch Court of Session. It constitutes a useful work of reference for the library of a lawyer whose practice is to any considerable extent connected with workmen's compensation, and as the subject so closely concerns medical men it has also considerable interest for them.

Cases of medical interest in which there were appeals during the 12 months dealt with, include Walsh *v.* Locke and Co. (Newland), Limited (England), in which the old topic of the refusal of a working man to undergo a simple operation in order to regain the capacity to work was under review. In this instance the refusal was that of a miner to have a stiff finger removed, so as to enable him to handle a pick, without a "guarantee of success." The county court judge found the refusal to be reasonable, but the Court of Appeal held that there was no evidence to support that finding. Jones *v.* Davies, Limited (England), was an appeal concerned with the liability of the workman, unsuccessful in an application to have compensation continued, to pay the fee of a medical man who had examined him for the employers in order to qualify to give evidence. The question was whether the fee was recoverable when the examination had taken place before proceedings were commenced. It was held to be sufficient that a dispute had arisen between the parties. In Lewis *v.* Port of London Authority (London) a good deal of medical evidence, some of it conflicting, had been given, and in the judgment of Lord Justice Pickford the position and the functions of the medical referee sitting as an assessor were discussed and defined, comparison being made with the practice of the Admiralty Court and the amount of weight there given to the advice of the nautical assessors. "He is there," said his lordship, "to give his advice, in the one case upon nautical matters and in the other case upon medical matters. He is not there to give a judgment or to find the facts, and his advice is no part of the judgment, and may be disregarded by the judge, as it has been in the Admiralty Court on not very infrequent occasions."

Naturally, in a large number of cases there is record of accidents involving a considerable amount of medical testimony, although in some of them the consideration of this may not have formed part of the duties of the Court of Appeal. Perhaps the most interesting of these are concerned with the question whether incapacity is due to "an accident" or to "disease," and, again, the variety

seems almost infinite of the ways in which "accidents" may take place, leaving as a matter of dispute whether they arose out of and in the course of the workman's employment. In both these classes of dispute, we need hardly say, medical evidence is very frequently the most conclusive obtainable.

Dairy Chemistry.

By HENRY DROOP RICHMOND, F.I.C. Second edition, revised. With numerous tables and 49 illustrations. London: Charles Griffin and Co., Limited. 1914. Pp. 434. Price 15*s.* net.

Mr. Richmond's book has always been accepted as a standard work on the chemistry of dairy products, although no new edition has been forthcoming until now, while the first edition was published in 1899. For some years past, however, the author has been seriously handicapped by ill-health. We are glad to learn that this unfortunate reason need no longer deprive all those closely connected with the examination of milk products of the advantage of gaining his more recent experiences on the subject.

In his preface he admits that by lapse of time certain portions of the text had become obsolete, which has necessitated their rejection in the present edition and their replacement by matter based on the latest investigations. We observe that amongst other new matter care has been taken to include the new and improved methods of analysis which have been devised within recent years for the examination of milk and milk products. He has also reserved space for an account of the enzymes in milk and their detection, which, in view of the importance attached to these entities and of their presence indicating raw milk, claim special attention.

The book is a thoroughly practical one, and this revised edition will be heartily welcomed by all those engaged in the control of milk products and in the business of the dairy and milk product factory.

Mutual Aid.

By P. KROPOTKIN. London: William Heinemann. 1915. Pp. 240. Popular edition, price 1*s.* net.

THIS admirable book was first published in 1902, and is now issued in a popular form on account of its subject matter being a sound reply to the argument of the Bernhardi school of thinkers, who, putting a mistaken construction upon Darwin's principle of the "struggle for existence," maintain that the horrors of the present war are a necessary corollary of that principle. Prince Kropotkin puts forward the thesis—and maintains it by a wealth of facts collected from animal life, savage society, barbarian tribal laws, mediæval society, and modern life—that biological and social progress should be interpreted "not in terms of overbearing brute force and cunning but in terms of mutual coöperation." The result is a work of singular interest, exhibiting very wide reading, written in a simple and clear style, and naturally coloured all through with the candid and transparent personality of the writer.

Few persons besides those who have studied the subject as specialists are aware how deeply the principle of mutual aid sank into, or we may say was the essence of, the life of the mediæval city, and Prince Kropotkin's informing chapters on this subject should be read by everyone. The mediæval guild was the evolutionary product of the tribal "gens" and the village community. It was an association of men and women working together for the common good of the members, and in this ideal they were at one, as the very name "universitas," the technical and legal word for a guild, shows. There is a remarkable passage in the Psalms which demonstrates how deeply the notion of the connexion between a city and mutual interests had sunk into the minds of men. In Psalm cxxii. 3 the Prayer-book version has, "Jerusalem is built as a city that is at unity in itself." The Vulgate version (the number there is cxxi.) reads, "Civitas cujus participatio ejus in idipsum." The Septuagint reads, πόλις ἧς ἡ μετοχὴ αὐτῆς ἐπιτοαυτό, "a city whose fellowship (sharing) is complete." But the original Hebrew expression means "a city that is well compact together," in reference, probably, to the protecting walls and towers, but without the idea of community or fellowship. After his review of the mediæval city Prince Kropotkin points out how the State tried again and again in various countries to be the only bond of union, and shows how this attempted autocracy broke down owing to the reappearance of the mutual aid tendency. Mutual aid, though in Prince Kropotkin's opinion somewhat fallen from its high estate by being confused with or contaminated by "charity," is to-day really widespread both in public and private life.

The appearance of this work is most opportune at a time when mutual aid is more needed than ever, and as its price puts it within the reach of even a very modest purse, we hope that it will be widely read and seriously thought over.

LIBRARY TABLE.

A Synopsis of the British Pharmacopœia, 1914, and of the Poison Laws of Great Britain and Ireland. By H. WIPPELL GADD, F.C.S. Eighth edition. London: Baillière, Tindall, and Cox. 1915. Pp. 196. Price 1*s.* net.—The modesty of the preface of this unpretentious little book almost disarms criticism. After paying compliments to the new Pharmacopœia and conceding that for many purposes the volume itself must be consulted, the author proposes his book as a summary for students and as a pocket reminder for medical men and pharmacists. Within a limited range the book will be helpful to those who wish to read while running, but it will often provoke a desire for more detailed information or for further elucidation of the text. The lack of guidance will be felt most acutely by those who refer to the section on Tests for Chemicals, which gives no information about the composition of the tests employed; we meet with T.S. ferric chloride and with T.S. mercuric chloride, but fail to find any indication of the strengths of these test solutions. On the other hand, the employment of heavy type for the footnotes from the Pharmacopœia which call attention to alterations in strength of official preparations will be a great boon to the young man in a hurry. The synopsis of the laws affecting the sale of poisons is clear and well arranged.

The Mind at Work: A Handbook of Applied Psychology. Edited by GEOFFREY RHODES, with contributions by CHARLES BUTTAR, M.D., E. J. FOLEY, and Professor L. L. BERNARD, Ph.D. London: Thomas Murby and Co. 1914. Pp. 235. Price 3*s.* 6*d.* net.—In this little compendium are two chapters by Dr. Buttar on nervous anatomy and physiology, which exigencies of space, no doubt, have rendered almost too concise; nine on elementary psychology, dealt with mainly, or at least to a

considerable extent, from the physiological side, by Mr. Foley; two by the editor (containing much by way of quotation) on the subconscious mind, dreams, suggestion, and hypnotism; and one by Professor Bernard on the applications of psychology to social problems. We feel that the authors would have done themselves and their subject greater justice had the purview of the book been less comprehensive or its individual sections more detailed. It suffers, as a whole, from the brevity with which its subjects are handled. In a short glossary of psychological terms at the end the word psychosis is used in a sense different from that in which it is ordinarily used by the medical profession. Organic sensations are said to be "those that arise from the body itself, as aches and pains," a definition which scarcely defines.

A Manual of Normal Histology and Organography. By CHARLES HILL, Ph.D., M.D., Professor of Histology and Embryology, Chicago Veterinary College, &c. Third edition. London and Philadelphia: W. B. Saunders Company. 1914. Pp. 483. Price 10*s.* 6*d.* net.—We have not much to add to our notices of the two previous editions of this book. Doubtless its author intends it primarily for veterinary students, and to this is to be attributed the attention given here and in former editions to the subject of the teeth, as well as the new sections which appear now for the first time on the stomach in ruminants and on the hoof of the horse—this last a very interesting feature, though lying a little outside the needs of the medical student. Other novelties in this edition are said in the preface to lie in the "topics dealing with heredity and sex, glands, blood and lymph." The index gives singularly little help in identifying the sections devoted to these subjects, "heredity" being assigned to p. 26, on which the word does not even occur, while "lymph" is not indexed at all apart from compounds such as "lymph-gland" and so forth. A very simple division of white corpuscles is adopted, without any of the refinements of classification sometimes practised, but we do not mention this as a fault. The best feature of the book is its illustration.

Know Your Own Mind: A Little Book of Practical Psychology. By WILLIAM GLOVER. Cambridge: University Press. 1914. Pp. 204.—Mr. Glover has written a useful little book of everyday psychology, intended to popularise the subject. With this end the matter has been dealt with on elementary lines and in simple phraseology, while numerous practical illustrations and illustrative instances ensure the attractiveness and readableness of the work. It does not pretend to cover the ground completely or equally, but for the immediate purpose it serves very well, presenting that combination of technicality and lucidity which is a sufficient index of the author's own grasp of his subject. The beginnings of mind are discussed, and how ideas get into the mind. Mental machinery is sketched, apperception and what is implied thereby is rather more fully handled, and there are readable chapters on observation, judging, attention, and interest. The author's point of view is frankly Herbartian, but the applications of the teaching are essentially modern and up to date. To the individual of average intelligence and education who wishes to know more of "how it works" this fresh and well-written précis of the mind's activities and diversities may be cordially recommended.

JOURNALS AND MAGAZINES.

Quarterly Journal of Medicine. Edited by WILLIAM OSLER, J. ROSE BRADFORD, A. E. GARROD, R. HUTCHISON, H. D. ROLLESTON, and W. HALE WHITE. Vol. VIII., No. 30. January, 1915. Oxford: At the Clarendon Press; London, Edinburgh, New York, Toronto, and Melbourne: Humphrey Milford. Subscription price 25*s.* per annum; single numbers 8*s.* 6*d.* net each.—The contents of this number comprise: 1. Notes of Further Observations upon Dyspnœa and its Relation to Blood Reaction, by Thomas Lewis and Joseph Barcroft. The influence of reduced alkalinity of the blood or acidosis in the production of dyspnœic states is further examined by means of a study of the percentage saturation of the blood with oxygen when exposed at 37° C. to 17 mm. pressure of that gas. From a study of a series of cases of heart disease the authors conclude that from the point of view of blood reaction and dyspnœa cases of heart disease may be divided into two classes. The first comprises relatively simple and uncomplicated cases in which, though cardiac failure may be present, recovery generally occurs. In this group no acidosis is found. The other group comprises many of the cases of heart failure in middle-aged or elderly subjects, in which reduced alkalinity in the blood is frequently present. It appears, however, that the acidosis is not to be attributed to heart failure only, and that there may be a renal factor in its production. Some observations are recorded upon cases of mechanical dyspnœa, which seem to indicate that acidosis may be a factor even in such cases. 2. Observations on Thomsen's Disease, by W. Johnson and Geoffrey Marshall. In a family of eight children, four were found to be affected with Thomsen's disease, and three of these have been carefully investigated. As a result of their observations, Dr. Johnson and Dr. Marshall suggest that in this disease there is an increased resistance to the passage of nervous impulses, and they believe this resistance to be in the synapses. They found that strychnine has a marked effect in lessening the myotonic character of the contractions. They believe that histological changes in the muscle are secondary effects—namely, a form of compensatory hypertrophy. Their observations lead them to suggest the use of strychnine in the treatment of this disease. 3. The Rationale or Modus Operandi of the Wassermann Reaction and Abderhalden's Test, by J. E. R. McDonagh. From a study of the physico-chemical properties of the individual factors in the Wassermann reaction and in Abderhalden's pregnancy test, Mr. McDonagh offers the suggestion that neither of these reactions is specific, but that they are group reactions which depend on certain physical conditions of the protein molecules. He believes that in the Wassermann reaction we are dealing with a pure precipitation, and in Abderhalden's test with precipitation and hydrolysis. 4. The Metabolism of Nitrogen in Dermatoses: General Review by H. L. Tidy. From a study of the literature the following general conclusions among others are arrived at: changes in the nitrogenous excretion in various dermatoses are the result of the condition of the skin, and are not connected with the cause of the disease. Retention of nitrogen is apparent and not real, and is accounted for by the abnormal excretion of nitrogen by the skin. It is suggested that a low protein diet is worthy of trial in forms of dermatoses where the nitrogenous excretion is disturbed. 5. The Treatment of Congenital Syphilis, by Leonard Findlay and Madge E. Robertson. The results of treatment of congenital syphilis by means of neosalvarsan are analysed, and it is stated that this drug is superior to mercury in alleviating many of the manifestations of the disease. It is advised that the drug should be given intravenously, preferably into the veins of the scalp.

Dental Record.—To the February issue of this journal Mr. C. A. Achner contributes a paper on the light wire splint for fractures of the mandible. The best method of adapting the splint to various types of fracture is shown by a series of stereoscopic photographs. The apparatus was reviewed recently in our columns.—Mr. J. F. Colyer contributes a further instalment of his paper on injuries of the jaws and teeth in animals. Injuries to the tusks of elephants are described, as well as injuries to the teeth of rodents and carnivora.—Mr. Norman G. Bennett has an article on the relationship between the size of the teeth and the size of the jaws. He considers there is reason to uphold the three views that have been put forward to account for the great variation that exists. These views are (1) progressive inherited

changes in the jaws, proceeding more quickly than in the teeth; (2) inheritance of the jaws from one parent and the teeth from the other; and (3) defective growth of the jaw as the result of disuse or environment subsequent to calcification of the teeth germs.

British Dental Journal—The issue of this journal for February contains a paper by Dr. E. C. Kirk on the Chemistry and Physiology of the Saliva. The author gives a complete résumé of the work on the physiology of saliva which has been carried out in America since 1909. He lays great stress on the composition of the saliva, and considers it a most important index of metabolism. There is a reprint of an article by Dr. C. H. Mayo on Mouth Infection as a Source of Systemic Disease, and a useful paper by Dr. Gilmer and Dr. Moody on the Bacteriology of Alveolar Abscess.

THE ANNUAL REPORT OF THE MEDICAL OFFICER OF THE LOCAL GOVERNMENT BOARD FOR 1913-14.[1]

I.

THE report of Dr. Newsholme, medical officer of the Local Government Board, recently issued as a supplement to the Board's general report for 1913–14, has already been noticed in THE LANCET in general terms. But many points therein merit special mention. Although the several annual and special reports of the Medical Department are primarily designed for the information and guidance of health officers, they nevertheless abound with records of scientific investigations respecting the nature and prevalence of disease which are of profound interest to every student and practitioner of medicine. The arrangement of matter in the present report corresponds to that in its predecessors—the administrative considerations derived from the experience of the year being set out in relation to the course of events indicated by our national records of sickness and mortality. We propose to comment mainly upon topics which are regarded by Dr. Newsholme as exceptionally important, or which have been only sparingly discussed elsewhere.

Waste of Infant and Child Life.

In the year 1913 English infant mortality was at the rate of 110 per 1000 births, which is somewhat above the rate of 1912, but as compared with previous years the curve is considered satisfactory. Equally satisfactory, likewise, is the aggregate decline of mortality at ages up to five years. From a table based on the experience of 1911 it appears that out of a given total of births the largest number survive to the end of the fifth year in the rural districts, the smallest number in the county boroughs. Fully 88 per cent. survive to that age in the southern division and 83 per cent. in the midland, whilst only 81 per cent. survive in the north of England and in Wales. A statement is added of the relative magnitude of the chief causes of mortality in infancy and early childhood, which throws light on the possibilities of further reducing the waste of child life. From this we gather that over one-fifth of the deaths in infancy, and nearly one-third of the deaths under 5 years, are due to infective diseases, including tuberculosis. Pneumonia and bronchitis, which should also be classed as infective, account for about one-fifth of the deaths under 1 and under 5 years respectively. Solution of the problem of protecting child life and securing correlative improvement in the health of survivors beyond childhood evidently consists largely in the prevention of infections. In these and some other conditions the previous nutrition of the infant is of chief importance, and the factor which determines the result of infection, when acquired, is not infrequently rickets. Study of the now available returns of mortality in early infancy leads to the conclusion that most of the deaths under the age of four weeks are due to causes originating before birth. Comparing the experience of the year 1912 with that of 1905, it appears that in the first month of life the death-rate has fallen by not more than 8 per cent.; in the next two months it has fallen by 29 per cent.; in the second three months by 40 per cent., and in the last half of the period of infancy by 35 per cent. The relatively insignificant decline of mortality in the first month of life probably indicates that congenital disease and enfeeblement are largely responsible for fatality in this period.

Government Grants in Aid of Preventive Schemes.

At the instigation of their medical staff the Local Government Board have recently devoted serious attention to questions of infant life protection, the well-directed efforts often made by municipal and voluntary agencies for dealing with the matter having been duly appreciated. By the representations of eminent members of the public health service as well as by their own departmental experience, the Board are convinced of the necessity for more extensive and systematic measures than those that have hitherto been practicable. Recognising the inability of many local authorities to bear the entire cost of adequate schemes for the promotion of maternity and child welfare, they are disposed to intervene with direct financial assistance. Accordingly the Board have applied for Treasury sanction for the apportionment of grants in respect of work of this character initiated under official sanction by municipalities or by voluntary associations. They further express their readiness to afford expert advice and assistance to sanitary authorities contemplating the initiation of schemes or the extension of those already in operation. The action of the central authority in thus attempting to provide for one of the most pressing needs of local sanitary reform is a very valuable one.

Infant Welfare Work.

The necessity of safeguarding child life at its origin, upon which depend the health and vigour of survivors at adult ages, appeals with tenfold earnestness in time of war. In view of the remarkable activity recently displayed by local authorities and voluntary agencies for the promotion of maternity and child welfare work, the medical officer devotes considerable space to the consideration of the subject. The development of a comprehensive scheme for this purpose has already been announced in two special reports by Dr. Newsholme[2] dealing exhaustively with the problem of English mortality in early life. From these documents a close interrelation became apparent at the outset between defective sanitation, poverty, and intemperance on the one hand and excessive infant fatality on the other. Account was also given of efforts already made in this country for reducing the waste of infant life. In his report for 1905–6 Sir William H. Power, at that time medical officer to the Board, distributed to the local medical officers of health improved and considerably extended forms of infant mortality tables for use in their periodical reports, and invited their coöperation in the hope of ensuring success for the new departure. It is gratifying to learn that the response to this appeal has been eminently satisfactory, and has resulted in materially stimulating official study of this previously neglected subject. The statistics compiled since 1905 from the amended tables then issued constitute the basis of comparison in Dr. Newsholme's two recent reports. Appreciative reference is made in the present volume to important early efforts for the preservation of infants in certain towns of the north. As early as 1899 Salford commenced a successful system of voluntary notification of births by midwives. The action of Huddersfield in 1906 in securing the prompt notification of births is another significant indication of the strengthening of public opinion in favour of this measure, and doubtless helped to facilitate the passing of the Notification of Births Act of 1907. By the middle of 1914 this Act had been adopted by most of the principal authorities, and its extension is still rapidly proceeding. Consequent on this extension the number of health visitors has materially increased. In addition to the numerous voluntary workers more than 600 health visitors are already employed by sanitary authorities for the care of infants. This implies that there exists a paid health visitor for every 6000 children under school age in England and Wales. Considerable saving of infant life is known to have resulted from the adoption of this Act, especially in some of the northern industrial centres. The expert advice given by health visitors, whilst primarily beneficial to the infants, is frequently found effectual in securing improved health conditions in the homes visited. In Manchester and Liverpool "infant consultations" are conducted under voluntary arrangement, and in Sheffield periodical consultations are

[1] London: Wyman and Sons. Price 1s. 11d.

[2] THE LANCET, Jan. 10th, 1914, p. 129.

held, the medical expenses being defrayed by the town council. Under the direction of the Birmingham Health Department infant consultations are held at stated times, and at Bradford there is a municipal infant consultation centre and milk depôt at which three whole-time medical officers and 13 nurses are employed. A new central infant welfare centre is being provided in this town to contain 20 beds for the accommodation of non-infectious patients under school age.

Antenatal Mortality.

Under the Births Notification Act, which provides for the reporting of live births as well as of dead births occurring later than the twenty-eighth week of pregnancy, some estimate is possible of the loss of life preceding birth, in addition to the large aggregate of infant mortality after birth, which is due to conditions arising in the antenatal period. A table in the text indicates the existence of local differences in the ratio of dead births to registered live births, from which it seems that a variable proportion of dead births remain unnotified. Dr. Amand Routh is quoted as estimating that abortions at an early stage of pregnancy are probably four times as numerous as the dead births, which may be taken to average 3 per cent. of the children born alive. This would imply a total antenatal mortality of 150 per 1000 births, which is higher than the average mortality in the first year after birth. The significant recent fall in the English birth-rate has recently been referred to by Dr. T. H. C. Stevenson in his remarks on fertility in relation to social status.[3] Evidence was adduced in support of the view that outside the range of extreme poverty the relation frequently observed between high birth-rates and high death-rates is by no means constant or unavoidable. Among agricultural labourers, for example, who constitute nearly 5 per cent. of the entire adult population, the families are of fully average size. Yet their infant mortality is below the general rate by 22 per cent.

Antenatal Preventive Work.

As the result of inquiry the Board are assured that a considerable amount of antenatal health work is locally in progress, especially in connexion with maternity departments and infant consultation centres. In the maternity departments of several metropolitan hospitals provisions exist for the home visitation of expectant mothers, who are attended at intervals both before and after confinement. At St. Thomas's Hospital all women applying for maternity aid are seen by a medical officer, who decides whether a case shall receive hospital or home treatment at her confinement. Home visits are undertaken by voluntary agencies; at these visits, which are highly appreciated, efforts are made to induce the expectant mother to provide suitably for the infant's arrival. The confinements at home are attended from the hospital, the supervision of mother and infant being continued for at least a year. Many of the children are kept under observation up to school age. At Leeds the maternity hospital furnishes a list of women applying for such aid, and these are visited by municipal health visitors at intervals up to their confinement, and in most cases subsequently also. The Leeds Babies Welcome Association have several centres at which expectant mothers are received, and midwives are asked to refer expectant mothers to these centres. Similar arrangements obtain at Newcastle-on-Tyne, Warrington, and St. Helens.

Organisation of Maternity Centres.

Under this heading the medical officer gives helpful suggestions concerning the establishment and management of maternity centres, in respect of which the Board are desirous to afford financial assistance. These institutions are believed to constitute the best practicable means of providing medical care for expectant mothers, as well as for mothers during confinement, and for these and their offspring until the latter arrive at school age. It will be remembered that, in addition to these centres, the salaries of health visitors and officers of infant consultations are among the subjects for Parliamentary grants. In order that the necessary information may be obtained regarding expectant mothers for whom medical assistance is required, the close coöperation of the local midwives is indispensable. In all cases it is essential to aim at securing adequate medical aid and guidance for both mother and child, from the birth of the latter onwards, both by means of home visitation and by attendance at a maternity centre for medical advice and treatment if necessary. The overlapping of duties with those of other voluntary agencies must of course be avoided.

Mortality in Connexion with Maternity.

The national death returns furnish conclusive evidence of the need of additional maternity work, whether the figures for infantile or for maternal mortality are compared. Nearly all the deaths in the first week, and most of those in the first month of life, are due to natal or antenatal causes. Of the total deaths in the first year about one-fifth occur in the first week, and one-third in the first month after birth. That this sacrifice of life is largely avoidable is proved by the great variations in incidence shown by the tables in various parts of the country. With respect to adult loss of life in connexion with maternity we learn that the deaths assigned to pregnancy and childbirth in 1912 amounted to 3473, or 3·98 per 1000 births, of which number 1216 were caused by puerperal septicæmia. Of late years there has been a reduction in the death-toll from these diseases, but it remains an unsatisfactory fact that even so recently as 1912 septic conditions in childbirth accounted for the loss of 1216 English mothers. Moreover, it is common knowledge that a vast amount of suffering of indefinite yet disabling character is caused by unskilled attendance in labour, and by failure to recognise septic and other conditions complicating pregnancy and childbirth.

(To be concluded.)

[3] Registrar-General's Annual Report for 1912, p. 22. THE LANCET, Sept. 12th, 1914, p. 707

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

MEETING OF COUNCIL.

AN ordinary meeting of the Council was held on Feb. 11th, Sir W. WATSON CHEYNE, the President, being in the chair.

It was resolved to issue Diplomas of Membership to 112 successful candidates.

It was also resolved to issue jointly with the Royal College of Physicians Diplomas in Public Health to six successful candidates.

In accordance with the recommendations of the Anatomical Committee, which was appointed last December to consider what steps should be taken to increase the present inadequate supply of subjects for dissection, it was resolved to write to the Secretary of State for the Home Department pointing out the importance of the matter and expressing the hope that steps might be taken to remedy the deficiency.

Mr. John Murray, surgeon to and lecturer on surgery at Middlesex Hospital, was elected a member of the Court of Examiners.

Mr. Charles Alfred Ballance was elected from the members of the Court of Examiners a member of the Board of Examiners in Dental Surgery.

A letter was read from Mr. T. Egerton Bryant thanking the Council for their resolution of sympathy on the death of his father, Mr. Thomas Bryant.

The PRESIDENT reported that in pursuance of the provisions of the Bradshaw Bequest he had chosen Sir Anthony A. Bowlby as Bradshaw Lecturer for the ensuing year.

DUBLIN LECTURESHIP IN OPHTHALMOLOGY.—The late Robert John Montgomery, M.A., M.B. Dub., F.R.C.S.Irel., bequeathed to the Board of Trinity College and to the President, Vice-president, and Council of the Royal College of Surgeons in Ireland a sum of money for the establishment of a lectureship in ophthalmology in Dublin. He desired that the lectureship should be known as the Mary Louisa Prentice Montgomery Lectureship in Ophthalmology, and that the appointment to it should rest each alternate five years with the Board of Trinity College and with the president, vice-president, and Council of the Royal College of Surgeons in Ireland. Joint regulations have been drawn up by these two bodies and the first election to the position will take place at the beginning of next summer session. The salary amounts to about £160 per annum.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 20, 1915.

Antityphoid Inoculation in the Army.

THE reopening of Parliament has enabled responsible Ministers to indicate the general attitude at present adopted with regard to antityphoid inoculation in the army, and from their answers to questions asked in the House it is easy to realise the trend of thought for the future. For the present Lord KITCHENER commends to the careful attention of every soldier a statement to which he attaches great importance in the interests of the health of the army. The probable development in the future may be gathered from the remark of Mr. TENNANT, Under Secretary of State for War, that evidence is accumulating in favour of making inoculation compulsory, and it is clearly indicated that the House of Commons will be afforded an opportunity of expressing an opinion on this matter. It is perhaps unfortunate that discussion should be deemed necessary, and still more unfortunate that the term "compulsory" must be employed. Discussion is not likely to convince those who approach the debate with a mental kink against what has been termed the arrogance of science; still the outcome of debate must be a foregone conclusion since the evidence in favour of inoculation is overwhelming. Public discussion is not likely to serve any useful purpose, for remarks made in the course of criticism, will assuredly be seized upon, separated from their context, and reproduced in distorted form by those who are actuated by objects far removed from the immediate subject —namely, the advisability of compulsory antityphoid inoculation in the army as a prophylactic measure. It is often assumed by honest critics that some occurrence of typhoid amongst those protected by inoculation is sufficient to discredit this form of treatment. Further study of the great diminution in frequency, severity, and mortality should convince those who are open to conviction. Omnipotence has never been claimed by any scientific man for any form of treatment. It would be equally unsound to question the general advisability of operations for appendicitis or of the adoption of Listerian methods because certain fatalities have occurred when treatment has been unduly delayed or when there has been some lack of technical precautions.

Under ordinary circumstances the mere suggestion of "compulsion" is sufficient to rouse a storm of invective and antagonism. The average man, accustomed to believe that he is a free agent, living in a free country, resents any interference with this belief, and yet, on consideration, he has to admit that the conditions of civilised life leave very little room for the exercise of irresponsible freedom. In times of peace any threatened interference with liberty of action affords a healthy stimulus for discussion and fosters party feeling. The language of the battlefield is used with complacency, the nation is said to be divided into hostile camps, and the gains and losses of the parties are recorded daily. With the declaration of war the national spirit asserted itself, and opponents stood shoulder to shoulder to meet the common foe, and all the minor interests of the past were overshadowed by the urgent needs of the present. Criticism was respectfully hushed and all combined to support the authority of the executive officers of the Crown. Circumstances now are affording an opportunity for the troublesome activities of a minority opposed to scientific progress. The comparative pause which has accompanied the deadlock in the trenches has naturally been utilised by the authorities in fitting the new army for active service and in endeavouring to strengthen the powers of resistance of those already engaged. Those who were silent in the early realisation of a common danger have recovered the desire to attack measures advocated by those in authority. With vague ideas that in some way antityphoid inoculation is connected with vivisection a veritable crusade of an unworthy character has been started, and it is urged that inoculation and vaccination have impeded the course of recruiting. Last week we published a leaflet to the troops, which Lord KITCHENER had commended to the careful attention of every soldier, and consideration of the eminence of those who signed the statement should be sufficient evidence of its value. Each individual soldier is told that, "For your own sake, for your country's sake, and for the sake of the Army you should not fail to avail yourself of the protection secured by this simple, safe, and well-tested measure." This is the language of persuasion and of reason, expressed in very temperate terms, and it assumes that good sense will prevail over prejudice, and that it may not be necessary to resort to compulsion. Had an additional argument been required, it might have been pointed out that the force of example was not wanting; that while men of all classes and ages have been enlisting, or undertaking some form of personal sacrifice by which they hope to be able to feel that they have contributed their share in safeguarding the nation, officers and medical men have, in addition, been inoculated to minimise the risks of exposure to infection.

The leaflet makes the personal appeal to the individual for his "own sake," but it would be well for him to realise that the reference to the country and the army is no mere rhetorical flourish. The care of each individual in the field is of immense importance, since sickness removes not

only one and the many who have to care for him, but it also serves to demoralise others, who may doubt the efficacy of the sanitary measures adopted to check the spread of an epidemic. Doubtless it is hoped that the leaflet will facilitate future measures by preparing the mind of the individual soldier for a general order. It will serve a good purpose if it shakes the belief in the truth of the "literature" circulated by opponents of vivisection, against whom, as indicated in the House of Commons, action conceivably might be taken for an attempt to impede recruiting and to stir up discontent amongst those actually on service in the field. So far as recruits are concerned, the term "compulsory" is not strictly applicable. Inoculation might be made one of the conditions of service, and these conditions, like those of height, weight, or chest measurement, can be altered at will. It might be inserted among the requirements for all likely to go on foreign service, since it is amongst those who serve at the front the risk of an epidemic is greatest, and that its occurrence tends to dislocate the most carefully prepared organisations. The difficulty that has to be faced is the enforcement of a new regulation which would affect those already in the field. So long as there is any room for the exercise of individual option, so that a single "conscientious objector" may by himself serve as a source of danger to the whole expedition, all efforts to influence by the force of reason are likely to be nugatory. In the light of our experience in South Africa, and in view of the evidence collected in America, it is sincerely to be hoped that, if Lord KITCHENER desires, Parliament will strengthen his hands in sanctioning any new regulation which will give effect to the representations he has received from his scientific advisers.

Gunshot Wounds of the Head.

MODERN small-arm projectiles are in some respects less injurious than those which were used 50 years ago, for if a modern bullet passes through a limb without encountering a bone, or a large vessel, or an important nerve, little harm may result, and recovery may be complete in a short space of time. With wounds of the skull, however, it is far otherwise. The modern bullet, though much smaller than its predecessors, travels with a velocity far beyond anything known until recent years, and when it reaches the skull it produces results which surprise us by their severity. Even now, though several wars have been fought with these modern weapons—and in the present war we have had some six months' experience of the effects of rifle bullets—yet it cannot be said with certainty that we are fully acquainted either with the mechanism of the bullets' action or with the most suitable method of treatment.

It was practically useful and scientifically interesting that the Medical Society of London held last week a debate on the subject of gunshot wounds of the head. As to the mechanism of the action of the bullet we had the results given us of some interesting experiments which Sir VICTOR HORSLEY had performed, a full description of which will be found in our issue this week. He chose a modelling clay as not very dissimilar in consistence from the tissues under consideration, and into a mass of this he fired bullets resembling those used in modern war, and he obtained some surprising results. The most striking point brought out by his researches was the fact that much of the harm done to the tissues by the bullet is due to its rotation rather than to its onward movement. Further, he attributes the varying effects of different bullets solely to the difference in sectional area, and not at all to the shape. The so-called explosive effect which is so striking a result of the modern bullet has been shown to be due to the fact that the brain has somewhat of a fluid nature, containing indeed a large proportion of liquid in its composition. Therefore, when the entrance of a bullet into the skull suddenly increases the intracranial pressure, this increase of pressure is transmitted with hardly any diminution in all directions, and the explosive action is brought about. Though much of all this is theoretical, the practical point as to what is the best treatment of a gunshot wound of the brain ought to be decided upon an understanding of the mechanical factors.

Treatment of bullet wounds of the head is at present regulated upon general lines, with due regard especially in the matter of prognosis to the special conditions. Sepsis in any part of the body is serious, but nowhere is it more serious than in the cavity of the skull, and it was generally agreed by speakers at the discussion at the Medical Society that a thorough attempt should be made at the earliest possible moment to cleanse the track of the bullet and to remove fragments of bone. What antiseptics are to be used must depend on the surgeon, but the cleansing must be thorough, and if this be done the chance of recovery is greatly increased. The other main harmful factor in the production of symptoms from cranial injury is the rise of intracranial pressure; this comes partly from the effusion of blood and partly from exudation, and when this rise of pressure is excessive it is essential that decompression should be practised at the earliest possible moment. Sometimes it is sufficient to clear the openings in the skull caused by the bullet; sometimes trephining must be done. An important suggestion in the treatment was brought forward by Mr. W. H. H. JESSOP at the debate at the Medical Society, when he pointed out that in cases of fracture of the vault by bullet or shrapnel there was an early papill-œdema, pointing to increased pressure, but that this papillœdema rapidly disappeared when decompression had been practised. In such cases, even when the œdema is well marked, no symptoms may be present, a point of the first

practical importance. We trust that the whole subject will, at some short interval, be again discussed by representative surgeons in order that this kind of practical suggestion may be widely forthcoming from different experts, while the sad circumstances in which we live render material for debate available.

Annotations.

"Ne quid nimis."

THE FOOD-SUPPLY OF THE GERMAN PEOPLE.

WE publish this week a detailed review of Dr. Paul Eltzbacher's remarkable pamphlet on the food-supply of the German people. This work is a complete and authoritative exposition of the situation which he and his collaborators foresaw might arise when the British Fleet began to exercise serious pressure upon the German resources. The figures are as striking as the arguments, and sufficiently show how enormous the task of the Allies has been.

THE BACTERIOLOGY OF CONDENSED MILK AND MILK POWDERS.

A REPORT concerning the effects of certain condensing and drying processes used in the preservation of milk upon its bacterial contents was issued last week by the Local Government Board. The investigation was undertaken by Dr. Sheridan Delépine. The three methods of preservation examined were: (1) the manufacture of sweetened condensed milk; (2) the drying of milk over heated revolving cylinders; and (3) the drying of milk by spraying it into a current of hot air. The experiments now reported were made with the view of ascertaining whether tuberculous cows' milk was still capable of conveying tuberculosis after being treated according to methods 1 and 2. Further experiments have been made on the general effects upon the bacterial contents of milk following the use of methods 2 and 3, but the results await further inquiries. In feeding experiments Dr. Delépine reports the superiority of dry milk over fresh milk, and points out the advantages of dry milk from the hygienic as well as from the commercial point of view. It is therefore regrettable, he adds, that the process of drying should not always yield an article entirely free from pathogenic bacteria. He concludes that if clean milk obtained from healthy cows were dried in a factory where suitable precautions were taken to prevent recontamination, dry milk almost free from bacteria could be produced. No experiments appear to have been made on the question of how long in a practically dry powder the organisms remain virile. The activity of bacteria is necessarily diminished in the absence of moisture, and milk powders do not, as a rule, contain more than 3 or at the most 5 per cent. of moisture which can be expelled by heat. In summarising his work Dr. Delépine states that the total number of bacteria present in mixed cows' milk has been found to be considerably reduced by treatment according to each of the three methods investigated. The reduction was greatest in the case of sweetened condensed milk, least in the powder obtained by spraying milk into hot air, while milk dried over hot cylinders occupied an intermediate position. In each of the three methods of treatment there was a stage at which the reduction in the total number of bacteria was much greater than that observed in the finished article ready for sale. This increase is attributed to recontamination. The interesting observation is made that the tubercle bacilli which had survived pasteurisation in method 1 and drying by heat in method 2 were still capable of producing progressive tuberculosis in guinea-pigs inoculated subcutaneously with milk containing these bacilli, but the course of the disease produced by these organisms was very much slower than that of the disease produced in guinea-pigs inoculated with the same amount of untreated tuberculous milk. The tuberculosis produced by the heated bacilli was "latent" or "occult" for some four weeks, while young rabbits fed with milk containing these modified bacilli did not contract tuberculosis. The report forms a valuable addition to the series of food reports issued from time to time by the Local Government Board, and it appears clear that if precautions were taken to guard the condensed or dried milk products from recontamination they would, generally speaking, be safer to use than raw milk.

EPILEPSY AND OPERATION UPON THE FEMALE PELVIC ORGANS.

IT is stated by some writers that the development and commencing activity of the female sexual organs are in some way concerned with the onset of epileptic convulsions. It has also been said that the time at which the menses cease to appear is again apt to be attended with the occurrence of epilepsy, but Nothnagel denies that this is the case. It would not be difficult to find a number of cases recorded in medical literature in which the onset of epileptic fits coincided with great accuracy with the occurrence of the menstrual period. Cases, too, are to be found in which the fits have ceased during a pregnancy, only to recommence with the return of the monthly periods. When we bear in mind the increased nervous excitability of the woman at the menstrual period, and further, when we remember the tendency to periodic recurrence of epileptic attacks and the periodicity of the monthly periods, it is not surprising to find that in a certain number of women the two conditions coincide so frequently as almost to lead to the conclusion that there is some definite relationship between them. There is, however, no certain proof of any etiological relationship between uterine and ovarian disease and epilepsy. Sir William Gowers said, "Of epilepsy due to disease of the uterus or ovaries nothing is seen except by gynæcologists," and from the point of view of a judge demanding evidence the statement stands. In spite of this opinion from so high an authority a number of cases have been recorded in which various operations have been carried out upon the pelvic organs of the woman for the purpose of curing epileptic fits. Dilatation of the cervix, the treatment of erosions, the amputation of the cervix, and even the removal of the healthy ovaries have been advocated, and indeed practised, from time to time with reputed benefit to the patients. That the fits have ceased and in some cases have never returned has been adduced as proof of the value of the particular procedure

adopted. It is, however, important to remember that the same may be said for many different operations, and it has been shown that any surgical procedure on any part of the body may influence favourably, for a time at any rate, the course of epilepsy. Osler quotes White as having collected a series of cases in which such diverse operations as ligation of the internal carotid, circumcision, castration, tracheotomy, excision of the superior cervical ganglion, and incision of the scalp have all been practised, often with good results. The extraction of a carious tooth has not infrequently had an equally good effect, or a treatment for worms. Fagge mentions the case of an American who had been castrated and treated with nitrate of silver in the hope of curing his epilepsy. His skin looked as if it had been polished with blacklead, but the result of the combined treatment was negative so far as the disease was concerned. A recollection of these and many similar facts concerning the operative treatment of epilepsy should prevent any gynæcologist who is careful to take a broad-minded view of his patients, and who has freed himself from the old and utterly erroneous belief, "mulier tota in utero," from practising the operation of removal of the healthy ovaries for the cure of epilepsy. The old-fashioned term "spaying" has rather dropped out of use at the present day, but if the enterprising surgeon who contemplates this operation will recollect that he is in reality spaying his patients he may think twice before carrying out such treatment. Naturally, if the pelvic organs are diseased and require removal this should be done, and if the patient also suffers from epilepsy she will no doubt derive benefit from the operation, and may even be cured for a time or completely of her convulsions. This is, however, no argument for the removal of healthy ovaries, and we should not have believed that such an operation was practised at the present day had not a correspondent written to ask our opinion of this procedure. If the pelvic organs are diseased in a case of epilepsy any necessary medical or surgical treatment should be carried out coincidently with the appropriate medical treatment for the disease. In a very few rare cases in which the genital tract is so malformed that the patient can never marry, as, for example, with absence of the vagina, and where at the same time she suffers from epileptic attacks recurring at monthly intervals, oöphorectomy might be justifiable. The removal, however, of the healthy ovaries, when a normal genital tract is present in an otherwise healthy woman, in the hope of curing epilepsy, is not likely to be successful and is never, in our opinion, necessary or justifiable.

GRADUATED EXERCISES AT OUR HOME HEALTH RESORTS.

THE observation that so many of our home health resorts present ample facilities for a course of graduated exercises in functional disorders of the heart is opportune and should receive careful consideration. In an interesting paper which Mr. J. S. Kellett Smith has sent us he refers, for example, to the extreme suitability of Eastbourne for the treatment of favourable cases, and there can be little doubt that other seaside health resorts present similar opportunities when their environment comes to be carefully studied. As Mr. Kellett Smith points out, even under normal circumstances it is not every patient who can visit a continental health resort, and it is not every case that can stand the journey. But a preparatory course—resisted exercises, massage, carbonated baths, or Bergonié treatment—can be given locally if necessary, and in addition to a favourable situation—near the sea-level and sheltered from the prevailing winds—and a mild winter climate, the disposition of the ground in many of our seaside places probably offers an excellent arena for carrying out the exercises for the terrain cure. With this object in view he has mapped out a course at Eastbourne, giving the various gradients on the parades and sea front, beginning with gentle exercises and ending with a more rigorous treatment by gradually bringing the patient to accomplish a stiff climb on the Downs and to Beachy Head. The principle throughout is to strengthen the heart by making it work with a lightened load, this being obtained by restriction of fluids when necessary and by the dilatation of the peripheral vessels in the big muscle groups and skin produced by exercise. Exercise is given by walking along roads of graduated steepness, commencing at level and progressing to hill-climbing, the activity and distance being increased as the case improves. The suggestion seems to us to be an admirable one, and should set other seaside authorities thinking.

THE FUNCTIONAL CAPACITY OF THE KIDNEY.

THE problem of investigating the functional activity of the kidney is admittedly a difficult one in view of the uncertainty which still dominates the definition of the renal function, which some consider to be under the influence of simple physical or physico-chemical laws, while others contend that it is controlled by laws, mysterious and unknown in their essence, like those which are attributed to the so-called vital energy. Dr. L. Pezzana[1] has studied the application of the phenolsulphonphthalein test to this question, and considers it markedly superior to all others for estimating the functional capacity of the kidney from the point of view of its facility and of rapidity of elimination. Phenolsulphonphthalein, discovered by the American Ira Ramsen, was first proposed for the study of the renal function by Rowntree and Geraghty, who proved its harmlessness and exclusive elimination by the kidney. It is administered by subcutaneous, intramuscular, or intravenous injection in doses of 6 mg., and in normal conditions is completely eliminated in from two to four hours. In the urine phenolsulphonphthalein is discoverable by simple alkalinisation, and the quantity also may be easily estimated by means of a suitable colorimeter. The patient is made to drink 200 to 300 c.c. of water and then to micturate so as completely to empty the bladder, prior to the injection being made, preferably into the gluteal muscles. The urine passed after 6–10–15 minutes is received into vessels containing a few drops of solution of caustic soda, and the moment when elimination begins is shown by the red colour imparted to the urine as soon as it comes into contact with the alkali. For the estimation, the urine passed in the first hour is collected, 10–15 c.c. of a 15 per cent. solution of sodic hydrate added, and diluted with water to a litre; a portion of this is then placed in the colorimeter, which gives the actual percentage eliminated. The same is done with

[1] Il Policlinico, vol. xxi., 1914, Medical Section, Fasc. 12, December, 1914.

the urine passed during the second, third, and fourth hours. The normal colour of the urine does not usually affect the colorimetric estimation even in cases when the samples only contain 10–20 per cent. of the substance and satisfactory practical results can be obtained. In cases of abnormal colouration, however, from jaundice or blood, it is better to decolourise the urine with animal charcoal or precipitate the pigments by acetate of lead. The results of the author's researches in cases of nephritis show that neither in the acute nor chronic forms does the kidney ever become impermeable to phenolsulphonphthalein, but there is a marked delay in its elimination, and a still more marked diminution in the total amount eliminated. By applying the test in cardiac affections, with and without perfect compensation, an important fact was elicited. In both these classes of case the elimination was good, although the total quantity was slightly below normal, and whereas in the latter class clinical methods showed renal stasis in a marked degree the test proved that the functional capacity of the kidney was very much greater than in cases of nephritis, even where examination of the urine did not disclose any serious changes. This fact shows the value of the test in those cases where great diagnostic difficulty occurs as to whether renal changes are secondary to stasis, and therefore to the cardiac condition, or whether the latter condition is not on the contrary secondary to the nephritis.

THE MEDICAL SCHOOL OF MELBOURNE UNIVERSITY.

IN 1852 Dr. Anthony Colling Brownless, a distinguished student of St. Bartholomew's Hospital, settled in Melbourne, and in 1855 he became a member of the council of the recently founded University of Melbourne which had been established two years previously, and at once devoted his energies to bring about the establishment of a medical school. On his motion it was ordered in 1856 that lectures in medicine should be delivered in the ensuing year. Dr. Brownless in 1857 submitted a scheme providing for professors of anatomy, physiology and pathology, materia medica, therapeutics and dietetics, and a staff of lecturers; but when an application was made to the Government for a grant of £21,000 for the erection and equipment of the necessary buildings, it was objected that the time was not yet ripe, so the grant was not forthcoming. In 1858 Dr. Brownless became Vice-Chancellor of the University and efforts to obtain Government assistance were repeated but without success. In 1861 the Medical Society of Victoria took the matter up, and after discussion with the medical school committee, now organised as a definite body, it was determined to start the school at once though on a modest scale, the cost of the buildings not to exceed £4000, and the scheme submitted by Dr. Brownless in 1857 was accepted on this basis. On account of a falling off in the revenue it was stated again that funds for the buildings could not be provided. The Vice-Chancellor suggested a general retrenchment of expenditure, and the university lecturers on law and civil engineering generously gave up a portion of their salaries to assist in the formation of the medical school. In 1862 a five years curriculum was laid down, with five examinations for the degree in medicine. Dr. John Macadam was appointed lecturer on chemistry, and on the nomination of Sir James Paget and Sir Richard Owen Dr. George Britton Halford was appointed professor of physiology. From this time onward progress was rapid. In 1863 the medical school buildings were begun, and in 1864 the Melbourne Hospital opened its arms, though without any excess of enthusiasm, to the first batch of third year students. In that year the medical school buildings were completed, and this was the date chosen by the Medical Faculty of the University as the point from which its jubilee, celebrated last year, should be computed. An interesting account of the jubilee has been published in book form.[1] Sir Harry Brookes Allen, M.D., Dean of the Faculty of Medicine, traces the history of the school in detail, with many interesting pictures of the buildings in earlier and more recent times and many portraits of those to whose devoted services the progressive building-up of this school to its present high standard is due. An amusing echo of the mid-Victorian conflict between religion and science" is related by Professor Allen. When Professor Halford in 1869 applied to the council for permission to give a public lecture on "Protoplasm" it was refused on the ground that "matters of politics or religion should be avoided." Melbourne University was early in the field in the encouragement of women medical students, and Mr. Grice, the president of the Melbourne Hospital, pays a high tribute to the great credit its women graduates had brought to the school and to the high average place they had attained in the class lists.

MASTITIS DURING PREGNANCY.

FEW cases have been recorded of mastitis during pregnancy. In the *Boston Medical and Surgical Journal* of Dec. 24th Dr. B. R. Whitcher has reported the following case. A rather poorly nourished woman was seen on Feb. 2nd, 1913. She was of nervous temperament and subject to dyspepsia and constipation. She had been married in the previous November, and had a fall in which she struck her right arm against her breast. Ever since a spot, which was sore and tender, especially at the time of menstruation, remained. On examination a hard nodular lump was felt to the inner side of the nipple. Under ichthyol and belladonna ointment the symptoms were greatly relieved. In October, 1913, she became pregnant. In April, 1914, she was again seen for a tense, brawny, and very tender lump on the inner side of the right breast. Ichthyol and belladonna ointment were again used, but the lump became more painful. As it was thought that the pain might be due to early lactation aggravating the old injury, the breast pump was applied and half an ounce of milky fluid was drawn off with considerable relief. After a few days the lump began to enlarge and became redder and more brawny. On May 10th an incision was made under ether and nearly 3 oz. of pus escaped. A counter-opening was made for free drainage and gauze wicks were introduced. Healing was complete by June 5th. Two other abscesses formed —one outside the nipple, the other in the upper and outer quadrant. It was arranged to operate on them on June 14th, but labour came on and was perfectly normal. On the following day there was so much pain that the abscesses were opened and drained. The infection was of the

[1] University of Melbourne Medical School Jubilee, 1914. Melbourne: Ford and Son. Pp. 108.

diffuse interstitial type. Dr. Whitcher refers to the few recorded cases of abscess of the breast during pregnancy—all in American or German literature. In one case an abscess developed in the ninth month after an attack of facial erysipelas. In another double mastitis followed eczema of the nipples in the sixth month. Incision of the right breast yielded pus, of the left turbid fluid. A primipara developed an abscess after being scalded with hot coffee. In all the cases hand-feeding of the child had to be adopted. The etiology of abscess of the breast during pregnancy appears to be as follows. In the majority of women pyogenic organisms are present on the nipples and in the milk ducts in greater or less number, according to the habits of cleanliness. In some cases organisms may be present in the blood stream. As a rule, these organisms are innocuous, especially when there is a general condition of good bodily resistance. But when engorgement of the breast occurs conditions favourable to their growth are developed, and when the breast is injured before or during pregnancy the resistance is still further lowered. In the case reported by Dr. Whitcher the underlying cause was the injury to the tissues of the breast, which never regained their normal condition. Possibly the ill-nourished patient had pyogenic organisms in her blood, for she had also an abscess of the finger. In the first case quoted, with such an infection as erysipelas the blood may have contained organisms. In the second case infection probably took place through the eczematous nipples. In the third case there was no visible solution of continuity at the site of the burn. Probably the organisms were already present in the milk ducts and attacked tissues the resistance of which was lowered by the burn.

CONGENITAL HEART-BLOCK.

MORE than ordinary interest attaches to the report by Dr. T. R. Whipham[1] of two cases of congenital heart-block. We believe that the first case, aged 2 years 2 months, is the youngest on record in which the definite proof of heart-block has been established. In this case, a well-nourished and full-time female, the pulse was slow, full, and regular. The heart-rate varied between 48 and 80 at different times. Over the præcordium a loud systolic murmur was audible with maximum intensity near the left sternal border, between the apex and the pulmonary area. Admitted into hospital with whooping-cough and some bronchitis, the pulse still remained at only 64 per minute. Fits of coughing did not quicken the rate; no cardiac symptoms were ever noted. There was a polycythæmia of 8,400,000 red corpuscles, and hæmoglobin was 110 per cent. The electrocardiogram showed definite 2:1 heart-block; that is to say, the auricular rate was twice that of the ventricular. The cause of the block was attributed to a congenital defect, possibly a patent interventricular septum, involving the auriculo-ventricular bundle in that vicinity. The murmurs would depend on this and not, of course, upon the incidental heart-block. The interest of the second case, of a girl aged 12 years, in whom a complete heart-block was proven by galvanometric methods, was that there was reason to believe that such a block had existed for six years, yet it was only at the age of 11½ that any cardiac symptoms occurred. These showed themselves as pain around the heart on exertion. The pulse-rate lay between 50 and 60 per minute and was slightly irregular, whilst in this case, as in the other, there was a loud systolic murmur of maximum intensity in the fourth interspace near the sternum. The same pathological cause is suggested for this case—namely, a congenital defect.

[1] Proceedings of the Royal Society of Medicine, Section for the Study of Disease in Children, December, 1914.

THE Council of the Royal College of Surgeons of England has granted permission to the Fellows of the Royal Anthropological Institute and to the Members of the Prehistoric Society of East Anglia to hold a combined meeting in the museum and theatre of the College on Feb. 23rd. Many recently discovered specimens will be shown and discussed. The meeting commences at 2.30 P.M. On the evening of the same day the combined societies will meet at 8.15 in the rooms of the Royal Anthropological Institute, 50, Great Russell-street, W.C., when Mr. Charles Dawson will give an account of the various types of implements and cultures met with in the deposits along the valley of the Sussex Ouse—including what may be described as the "Piltdown" culture.

Lord Lamington has been elected a trustee of the Museum of the Royal College of Surgeons of England in the place of Sir Edward Fry, resigned.

HISTORY OF PUBLIC HEALTH IN DUBLIN.

IN an appendix to the annual report on the health of Dublin, noticed in THE LANCET of Jan. 9th, Sir Charles Cameron gives some interesting information on the history of public health administration in Dublin. The first trustworthy information on the state of health of Dublin dates from 1798, when the Rev. James Whitelaw made a careful survey of the city, and in his report drew attention to the shockingly insanitary condition of the tenements occupied by the working classes. Matters appear to have changed little in the next half century, for in 1845 Dr. Thomas Willis, in a book on the "Social and Sanitary Condition of the Working Classes in the City of Dublin," spoke of the working classes as "sunk into that state of abject misery for which there is no parallel in any country in Europe." Within the next 20 years the municipal authorities began to show some sporadic interest in the health of the city, and in 1864 Edward Dillon Mapother was elected the first medical officer of health, and ten years later Sir Charles Cameron succeeded him. It was not, however, until 1879 that the statistics of mortality could be regarded as accurate. In that year the death-rate from all causes was 37·5 per 1000, and from nine specified infective diseases 6·2 per 1000. In the following year both rates reached their maximum—37·7 and 7·9. Thereafter they gradually sank, and in 1913 the general death-rate reached its lowest point—20·3 per 1000, and the zymotic death-rate was 2·4. The lowest zymotic rate was in 1905—viz., 1·5. It is noteworthy that within the past few weeks the general death-rate has approached 40 per 1000. Sir Charles Cameron furnishes an account of various activities of the Dublin corporation, which have had an important effect on the sanitary condition of the city. Of these the chief are the supply of the excellent Vartry water brought to Dublin in the late sixties; the substitution of a water-carried sewage system for the old system of privies and ash-pits; and the recent introduction of a system of main drainage by which the sewage is discharged after precipitation into the bay instead of directly and untreated into the Liffey in its course through the city. Sir Charles Cameron also details the various steps taken by the corporation since 1881 to improve housing conditions in Dublin.

THE FOOD-SUPPLY OF THE GERMAN PEOPLE.

(FROM A SPECIAL CORRESPONDENT IN A NEUTRAL COUNTRY.)

IN a pamphlet[1] of nearly 200 pages published at the end of the year 1914 Dr. Paul Eltzbacher, acting Rector of the Berlin High School, has edited an authoritative statement on the food-supply of the German people and England's plan to starve them out. In the preface he states that the problem is only to be solved by "combination of the politician, national economist, statistician, physiologist, farmer, geologist—yes, even the experienced housewife," and to this end he has put under contribution members of various faculties, amongst whom the name of Rubner and Zuntz will stand out as well known in the domain of hygiene and physiology. A paper band round the volume states that the book is intended to "show the seriousness of the situation and the means to assure our food-supply," and the whole is the result of four months' work in which, "after initial differences" of opinion, all the writers were finally "united on all essential points" and in the common aim that the "success of our weapons should not be spoiled by economic mistakes." The whole forms an exposition of the problems of a nation's food-supply with such wealth of information and authority as can hardly ever have been brought to bear before on the topic.

Chapter I. states under three headings

The Problem of an Isolated Political Economy.

1. The first deals with the *starvation plan.* Germany and Austria are completely surrounded by hostile lands except for five small neutral countries on whom no reliance can be placed. Germany in normal times has 21 milliard (£1,050,000,000) and Austria 5 milliard (£250,000,000) marks of external trade, and difficult as it might be to do without exports it might be impossible to exist without imports. The plan originating in England was stated more frankly in France, where the physiologist Charles Richet wrote in the *Figaro:* "Before nine months are out Germany will be on her knees suing for peace, unless indeed already speechless with hunger."

2. The second section deals with the conception of *Germany as a closed economic area* which must arrange to do the best it can for itself and by itself. Austria is in relatively less danger with its thinner population and larger agriculture, Germany's relation of external trade to population being three times greater. The "conquered lands" cannot be relied on for food with starvation already setting in. Denmark has already forbidden the export of barley. England states that she can last out indefinitely, and even though she may have made a miscalculation as regards the loss of German dye-stuffs and her business as middleman, yet it would be unsafe to reckon on a short war, and Asquith may have weighed his words before he spoke of a possible 20 years. "The best means to shorten the war is to prepare for a long one."

3. The *problem of an isolated political economy* is a new one for economists and statesmen. The modern fashion has been to think of the "world-wide" and the "personal," and internationalism and individualism have filled the field to the exclusion of nationalism. Now all this is changed; production must give place to consumption as the leading idea, and the supply of labour where needed becomes more imperative than the problem of unemployment. The foundation of non-profitable businesses may become a necessity, e.g., the drying of potatoes or the manufacture of nitrogenous manures. The freedom of the individual must be limited for the benefit of the State. "At this time everyone is, so to speak, a socialist." Export must be prohibited and maximum prices fixed, as well as even more drastic measures. In considering how all this may be done no optimism is permissible. "We must reckon not only with bad weather for the harvest, but also with a lack of skilled labour in the fields, of horses, and of manure, affecting the yield." The organisation of the people's food must not fail.

Chapter II. deals in greater detail with

The Reduction of the Food-supply.

1. *Reduced import.*—The import of fodder, amounting yearly to 10,000,000 tons, must largely cease, although the Baltic is still available, and at present increasingly so. The conception of conditional contraband keeps back most food-stuffs from direct import, nor can the small neighbouring neutral countries be expected to do much more than cover their own needs during the war. Belgium is the most thickly populated country in the world, and Russian Poland does not stand far behind. Roumania's supply of provisions will be entirely swallowed up by Austria.

2. *The home production of foodstuffs.*—The North Sea fisheries have been reduced to a minimum. Agriculture must also suffer from the lack of skilled labourers, horses, and manure. The farm labourer cannot at first be replaced by other workers, although his place may possibly be taken by prisoners of war from agricultural districts. Half a million horses have been taken by the army, and the usual annual import of 140,000 from Russia cannot be counted on. For manure four products are necessary. Potash and lime we possess in abundance, being, indeed, the chief exporting land of potash salts. On the other hand, there is a lack of phosphoric acid and of nitrogen. Phosphoric acid is normally covered by the supply of Thomas-slag, a by-product of the iron industry, and to the extent of one-third by the import of foreign phosphate. Some compensation may come from the Belgian iron fields and crude phosphates, but a deficit will probably remain. Nitrogen has so far come about equally as a by-product in the manufacture of coke and in the form of imported Chile saltpetre; and the latter will no longer be available, although the former may be increased and supplemented to some extent by means of calcium nitrite. In addition to these causes the agricultural production of East Prussia and Alsace-Lorraine has suffered, whilst it is not safe to reckon on a lasting out of stores in reserve. "We are as a people placed in the position of an individual who has up to now had a considerable income at command, and who learns by means of a sudden severe misfortune that with careful husbandry he can get on with much less."

Chapter III. deals with

The Food Requirements of the German People.

Section 1, on the *aim of nutrition*, gives a short sketch of the function of the human organism as a machine, distinguishing between the food-supply required to produce the running energy and that to make up for loss of substance. For the latter purpose and only for this is proteid required. Sufficient proteid must be supplied to make up for the regular loss, but not more than this, as fat and carbohydrate are precisely of the same value as producers of energy. 1 gramme of fat produces 9·3 calories, 1 gramme carbohydrate or proteid produces 4·1 calories; and Rubner's work makes it certain that from the point of view of energy-production it is quite immaterial whether the body uses one or other of these sources of supply. If, therefore, there are public grounds for reducing the consumption of proteid this can be done without concern so long as the hygienic proteid-minimum is retained. This quantity is a relatively constant one, whereas the requirement in energy-producers varies largely according to the mechanical energy of the subject.

2. The *requirement in calories* of the German people for a year must be determined. This should be expressed in net calories, allowing for the fact that proteid is excreted incompletely metabolised, whereas fats and carbohydrates burn without waste, and allowing further for the incomplete utilisation of substances of difficult digestion. The energy requirement of the organism depends on the work which it has to do and the warmth which it must produce, further to some extent on the temperament of each subject. Carl von Voit's basis for a man of 70 kilogrammes weight on a mixed diet gave 3050 calories for moderate work and 3575 calories for heavy work. Rubner's figures vary from 2445 to 6109 calories, and the average figure of 3000 may be taken as not

[1] Die Deutsche Volksernährung und der Englische Aushungerungs plan. Eine Denkschrift von Friedrich Aereboe, Karl Ballod, Franz Beyschlag, Wilhelm Caspari, Paul Eltzbacher, Hedwig Heyl, Paul Krusch, Robert Kuczynski, Kurt Lehmann, Otto Lemmermann, Karl Oppenheimer, Max Rubner, Kurt von Rümker, Bruno Tacke, Hermann Warmbold, und Nathan Zuntz. Herausgegeben von Paul Eltzbacher. (Friedr. Vieweg and Sohn. Braunschweig, 1914.)

too low. The influence of age and sex must also be considered. The requirements of the adult woman can be based on the lower male standard of work. Engel, Rubner, Atwater, and Zuntz have given tables for each year of life, the simplest being the new table of Zuntz, in which 40 per cent. is reckoned for age 2–4, 50 per cent. for age 5–9, 75 per cent. for age 10–14 years, from then on 100 per cent. for a male and 80 per cent. for a female, with a drop to 90 per cent. for the male after 60 years. Worked out on the basis of the German census of Jan. 1st, 1911, with a total population of 64,992,238 persons, an average of the various scales gives 49,543,889 units, which must be increased by 4·6 per cent. on account of the increase of population to the present year, giving 51,822,908 units. The calculation, 3000 calories × 365 × 51,822,908 = 56·75 billion calories, gives the total requirement of the German people for a whole year of the war.

3. The *proteid requirement* must be separately estimated, as it forms the building material of the body and cannot be replaced by any other foodstuff. Its complicated molecule contains not only carbon, hydrogen, and oxygen, but also invariably nitrogen and sulphur, in many cases phosphorus, and often iron and other elements. As the nitrogen content varies only within narrow limits, this can be used as a guide and the nitrogen balance of the body worked out. With an excessive intake of proteid nitrogen is at first stored up, but soon excretion again equals intake. The smallest intake of proteid with which the nitrogen balance can be maintained is known as the physiological proteid minimum. This may be as low as 17 grammes, but probably the organism comes thereby to harm in the long run. The hygienic proteid minimum is the quantity necessary to maintain the body in perfect condition and energy. This quantity varies within fairly wide limits with the kind of proteid and the composition of the rest of the food. The chief influence is exerted by the body weight. Voit held that for a body weight of 70 kilos. 105 grammes of proteid were necessary daily. This value was intentionally chosen high to allow of a certain margin, and, as Rubner pointed out, was taken from the statistical material of Munich, in which the consumption of meat is very large. Neumann in 1902 arrived at a value of 71 grammes; Schumburg in 1893 at an average value of 60 grammes; but as average values for all ranks of society on the usual mixed diet are being considered, it will be wise to allow for 70 grammes of proteid for an active man requiring 3000 calories of total energy. 70 grammes of proteid have a value of 287 calories, and therefore amount to 9·6 per cent. of the total food. On a vegetable diet this is easily possible, for potatoes contain only 7·1 per cent.; rice, 7·3 per cent.; rye bread, 8·7 per cent. of proteid. But for foods of animal origin a higher percentage of 15 per cent. to 16 per cent. of proteid must generally be reckoned. Hence, for the basis of this calculation it is assumed that the adult man takes 11 per cent. of his total calories in the form of proteid. For an average man of 3000 calories this gives 330 calories in the form of proteid, and therewith a daily requirement of 80 grammes of proteid; and in view of the fact of the varied diet of the population of town and country this is not too high a figure to take. The requirement of the adult woman may be put at 15 per cent. less, or 68 grammes; that of the child is 40 grammes for the first to the sixth year, 50 grammes for the seventh to the twelfth year, and 65 grammes for the thirteenth to the eighteenth year. Calculating now on the basis of the total population from the census of Jan. 1st, 1911, the total daily requirement of proteid is 4203 tons; and allowing as before for an increase of population by 4·6 per cent. up to the outbreak of the war, the yearly requirement of the German people works out at 4396 tons × 365 = 1,605,000 tons of proteid.

Chapter IV. treats of

The Actual Consumption of Food by the German People before the War.

In order to do this (1) the foodstuffs produced in Germany and used by man, and (2) the excess of import over export in such foodstuffs are determined. In order to determine further what part of the consumption is directly or indirectly from abroad it is necessary to add to the excess of imports in foodstuffs, the excess also in the importation of materials used in the raising of home produce. The consumption of meat, for instance, is given by the sum of beasts slaughtered in the country and the excess of import over export. But the

Total Consumption of Foodstuffs. Average of Years 1912–13.

Foodstuffs.	Total available foodstuffs.				Proportion of these foodstuffs coming from abroad.			
	Proteid	Fat	Carbohydrate	Milliards of calories	Proteid	Fat	Carbohydrate	Milliards of calories.
	in thousands of tons				in thousands of tons			
I. Vegetable foods—								
Cereals, pulses, and potatoes	1123·7	121·0	10005·5	46,653	160·7	10·1	982·7	4778
Vegetables ...	75·3	12·5	376·3	1,944	3·3	0·5	16·3	84
Fruits and nuts	23·2	36·0	411·5	2,117	6·2	8·5	131·2	642
Sugar and honey	0·1	--	1187·5	4,745	0·0	—	-585·4	-2338
Vegetable fats	—	184·4	—	1,715	—	158·9	—	1478
Cocoa	3·0	23·7	10·3	273	3·0	23·7	10·3	273
Alcoholic drinks	27·0	—	344·1	4,219[1]	3·4	—	46·3	474[2]
Total	1252·3	377·6	12335·2	61,666	176·6	201·7	601·4	5391
II. Animal foods—								
Meat and fats	431·9	1339·6	1·4	14,242	85·0	462·7	0·2	4655
Fish	52·4	28·7	2·0	490	33·7	21·5	1·5	346
Milk products	478·5	790·6	571·7	11,633	311·2	392·1	457·3	6764
Eggs	46·8	44·5	2·7	618	19·1	18·6	1·2	256
Total... ...	1009·6	2203·4	577·8	26,983	449·0	894·9	460·2	12,021
III. Foods in general...	2261·9	2581·0	12913·0	88,649	625·6	1096·6	1061·6	17,412

[1] Of this 2716 milliards from alcohol.
[2] Of this 273 milliards from alcohol.

Average Daily Consumption of Foodstuffs in 1912–13.

Foodstuffs.	Total available foodstuffs.				Proportion of these foodstuffs coming from abroad.			
I. Vegetable foods—	Gm.	Gm.	Gm.	Cal.	Gm.	Gm.	Gm.	Cal.
Cereals, pulses, and potatoes ...	46·2	5·0	411 0	1916	6·6	0·4	40·4	196
Vegetables...	3·9	0·5	15·5	80	0·1	0·0	0·6	3
Fruit and nuts	0·9	1·4	16·9	87	0·2	0·4	5·4	28
Sugar and honey ...	0·0	—	48·8	195	0·0	—	-24·0	-96
Vegetable fats	—	7·6	—	71	—	6·5	—	61
Cocoa ...	0·1	1·0	0 4	11	0·1	1·0	0·4	11
Alcoholic drinks ...	1·1	—	14·1	173[1]	0·2	—	1·9	20[2]
Total... ...	51·4	15·5	506·7	2533	7·2	8·3	24·7	221
II. Animal foods—								
Meat and fats	17·7	55·0	0·1	585	3·5	19·0	0·0	191
Fish	2·2	1·2	0·1	20	1·4	0·9	0·1	14
Milk products	19·7	32·5	23·5	478	12·8	16·1	18·8	278
Eggs	1·9	1·8	0·1	26	0·8	0·7	0·0	11
Total... ...	41·5	90·5	23·8	1109	18·5	36·7	18·9	494
III.—Foods in general—	92·9	106·0	530·5	3642	25·7	45 0	43·6	715

[1] Of this 112 from alcohol. [2] Of this 11 from alcohol.

proportion of this consumption due to the foreigner is obtained by the excess of imports in (1) meat, (2) live cattle, and (3) fodder used for feeding home cattle, all three expressed in terms of meat. The chapter ends with two tables, one giving the total consumption of foodstuffs for the average of the year 1912–13, and the same worked out in terms of daily consumption per head. These tables appear on the opposite page.

Under each heading a wealth of interesting detail is given. Thus of 11·9 million tons of home-grown rye, 1·1 million tons are reserved for seed corn and 2·7 million used for feeding cattle and for industrial purposes, leaving 8·1 million for human food, whilst half a million is exported. Of the 4·5 million tons of home-grown wheat on the other hand only 0·4 million is used for fodder and 0·3 for seed corn, while 3·8 remain for human use, and in addition 2 millions are imported. Other enormous items in the import list are 2·9 million tons of barley and 1 million tons of maize. On the whole group 14 per cent. of the proteid and 10 per cent. of the total calories required are at present imported. Fruit trees in the German Empire amount to 61 million apples, 29 million pears, 81 million plums, and 25 million cherries, of which the yield is estimated at 28, 16, 3, and 9 kilogrammes per tree respectively. Of sugar the home production amounts to 1·9 million tons, while 0·6 million is exported, so that something like 50 per cent. more sugar is produced in the country than is required. Under the heading of meat the number of beasts slaughtered amounts to: of swine 23·8 millions, calves 43, sheep 2·7, and cows 1·7, the amount of pork being, therefore, nearly five times that of any other meat. Of other creatures one notes 171,000 horses, 8000 dogs, 6 million tame rabbits, 13 million geese, and 80 million fowls, ducks, and pigeons. Reckoning imported barley in terms of pig-flesh it is estimated that 0·6 out of 2·6 million tons of pork are owing abroad as well as a very large quantity of imported animal fat. Of fish, as large a proportion as 64 per cent. of the total proteid and 71 per cent. of the total calories is imported. Of milk products 136,000 tons more are imported than are exported, largely in the form of butter and cream; also to a smaller extent cheese and milk. Enormous quantities also of cattle fodder are imported, including 2 million tons of bran and half a million ton of oil-cake. For calculating the proteid content of this, as utilised in the milk produced from them, 664,000 tons of raw proteid are estimated to account for 9·5 million tons of milk, and the final result gives 65 per cent. of proteid and 38 per cent. of total calories of milk products are imported. In eggs, a census of hens and turkeys is available, and the assumption made that a hen lays on an average 70 eggs in the year, weighing 50 grammes each, giving a total production of 257,000 tons of eggs. In spite of this, 41 per cent. of the proteid of eggs comes from abroad.

Chapter V. considers the question of

The Deficit and How to Cover it.

1. It is first necessary to determine the size of the *deficit* during the war, allowing on the one hand for the exclusion of foreign products, and on the other for some diminution of home production during the war. In a double sense must the deficit be considered in comparison with previous consumption as well as with actual physiological necessity. On the basis of the consumption of the years 1912–13, and allowing for the increase of population, the consumption during the war on present lines would amount to 90·42 billion calories with 2307 million tons of proteid. On the other hand, the actual physiological requirements for 68 million Germans works out at 56·75 billion calories and 1605 thousand tons of proteid. This means that our consumption exceeds our actual need by 59 per cent. of nutritive value and 44 per cent. of actual proteid. These figures are at first sight very surprising, especially in view of the careful statistics on which they are based. But the causes of the discrepancy are discoverable. To a certain extent the difference is inevitable even with extreme economy, as losses are unavoidable, especially when foodstuffs pass through many hands. But far greater than this is the unnecessary elevation of the consumption beyond actual need occurring in the houses of well-to-do people and due to actual waste of foodstuffs. The actual consumption exceeds the physiological requirement more in total calories than in proteids, and it may therefore be guessed that fats and carbohydrates are wasted more than proteid. These are in part more liable to spoil, especially as on account of their cheapness less care is bestowed on them. Potatoes, vegetables, fruit, and fat are lost in enormous quantities on the way to the consumer, whereas grains are more permanent and more care is taken to keep meat and milk fresh. In order to reckon our deficit we must determine what amount of foodstuffs we should be in a position to consume on the basis of our own production without importing from abroad, and of course without export. On the average of the years 1912–13 we have produced at home 71·24 billion calories and 1636 thousand tons of proteid. Home produce is likely to have increased since then up to the commencement of the war, but in order to be on the safe side we have reckoned with a diminution rather than an increase, bearing in mind that the next harvests will probably diminish on account of lack of trained labour, horses, and manures. Other sources may also be shorter during the war, as, for instance, the North Sea fishery. And in East Prussia and Alsace-Lorraine stores have been destroyed and removed and production lessened. Full account is taken of this by assuming a diminution of 5 per cent., when the figures stand as follows:—

Nutritive values.	Calories in billions.	Proteid in thousand tons.
Requirement	56·75	1605
Actual Consumption	90·42	2307
Available on continuance of existing conditions	67·68	1554

From this we see that if continued on present lines our economy will show a deficit of 25 per cent. of total foodstuffs and of 33 per cent. of proteid on what we have hitherto consumed. The position is more favourable if we consider actual physiological requirements when we have 19 per cent. more total food than we required and 3 per cent. too little proteid. The cause of the less favourable character of the second item is the complete falling out of foreign fodder for the production of such proteid-rich foods as meat or milk, whereas home-grown sugar is available in its entirety. With every day of continuance on present lines our deficit is increasing, and if no change is made for six months the deficit of available proteid for the following six months will be increased to 50 per cent. "This is the seriousness of the position." To cover the deficit in calories is a relatively simple task. To cover the deficit in proteid is a much more difficult one. Effort must be made to supply the lacking 3 per cent., and with an additional margin for the losses occurring between producer and consumer. "We can cover our deficiency," but certainly not in the sense of being in a position to consume the same quantities as before the war, but to more than cover the physiological need. "The means to do this is an alteration of our economical life in accordance with the situation created by the war." We have had success in limiting out travelling requirement to that of our forefathers, and can certainly do the same for our food requirements, becoming also in so doing more healthy. Any personal interest must be subservient to the good of the community, and the plea of the sugar industry for special treatment is not valid, as in such a time no money need be earned, but the nation must be fed. The problem requires treatment as a whole and on broad principles.

2. *Storage.*—Before the outbreak of the war Ballod had proposed the formation of State grain stores in which large quantities of corn were to be stored up against the outbreak of war. This was unfortunately not done, but at all events the quantities of grain and pulses required for spring sowing must be saved, and at the same time pork must be preserved in large quantities as the slaughtering of pigs is now inevitable, and the present glut would otherwise be followed by a later scarcity. At the same time the largest possible amount of foodstuffs should be obtained from neutral countries, as well as seed, manure, and fuel for motors. The guiding principles should be high nutritive value and small storage room. The prohibition of export of foodstuffs must be made absolute and sugar no longer exported, even though it should not reach England. No consideration for friendly relations with neutral countries should interfere with this most necessary condition.

3. *Adaptation of production.*—The essential point is the nutritive and especially proteid value of what is produced, and farmers must subordinate their personal interest to that of the community. Ground must be reserved for those vegetables which afford a large quantity of nutriment, such as beet and potatoes. The necessary seed for producing summer crops of grain and fodder must be provided, and the

difficulties owing to lack of labour and of manure surmounted in every possible way, whilst the culture of moors and of areas not at present available for agriculture must be taken in hand. Cattle must be fed with fodder at present too little considered, such as beech nuts, acorns, and green stuff, and every waste of fodder must be carefully avoided. The cost is a secondary matter, and the State must see that the necessary steam and motor ploughs are manufactured as well as the needful nitrogenous manures. Garden and wild fruits must be carefully stored. Foodstuffs must no longer be used for technical purposes—e.g., starch and spirit from grain and potatoes, soap from fats—except in so far as this cannot be avoided. The grain and potatoes used for feeding cattle have a far higher value if employed directly for the nourishment of man. "With the milk, corn, grain, and potatoes which a pig consumes, double as many human beings can be nourished as with the resulting pork." The experiments of Zuntz, Kellner, and other have shown that more than 50 per cent. of the calories are always lost by passage of foodstuffs through an animal. For the same reason the production of butter is to be restricted, and finally, careful attention paid to storage and preservation, especially of vegetables in the winter and of fruit in the form of jams and preserves.

4. *Adaptation of habits of life.*—The third and last method of covering the deficit is alteration of habits of life, and this need by no means be a radical one. Small alterations will suffice. Less meat and fat must be used than in the last few decades, but an exclusively vegetable diet is not necessary, and even vegetable foods may be limited without harm. Just at present an excess of pork is available, but as we have seen this should be preserved and not immediately consumed. In individual households the avoidance of loss and waste is imperative. Rubner calculated in Berlin that daily 20 grammes of fat are wasted in the effluent for each head of the population. Apart from economical use of food other points have to be considered. Starch should not be used for clothing, and coke is to be employed in preference to coal in order to make available the necessary ammonia for manure.

5. *The carrying out of the necessary measures.*—Three methods will be required: new laws, careful administration, and instruction of the people. The edict of August 4th, 1914, empowered the Bundesrat to enact all necessary economic measures. Maximum prices may be fixed where, as in the case of sugar, it is desirable to encourage a large consumption; minimum prices where, as in the case of meat, storage is preferable to immediate use. Regulation of prices is especially desirable where the use of one article is preferable to that of another—e.g., the abundant rye in preference to the limited wheat. Local authorities can buy up and store the present glut of pork; ensure a sufficiency of seed grain for the spring; and erect installations for drying potatoes and producing nitrogenous manure from the air. The most important measure remains—the instruction of the populace, which can be done through the agricultural societies, the trades unions, the national service of women, as well as through the press. If all these means are employed the English starvation plan will certainly be brought to naught.

Chapter VI. deals with

The Prohibition of Exports.

Three Royal edicts were already enacted on July 31st, 1914, dealing with foodstuffs, animals, animal products, and certain raw materials, the carrying out being left to the Chancellor. Certain exceptions have since been made which are not without importance.

1. *Grain.*—It is much to be regretted that our Government in friendly consideration for Switzerland allowed 2500 wagons of grain to be exported; but if this is done for Switzerland it may be a cause of complaint that similar consideration is not shown to other neighbouring neutral States. Switzerland as a small neutral country is also in the position to obtain its supply of grain through Italy. Denmark has not hesitated to prohibit the export of barley to Germany, and no political consideration can justify any relaxation with regard to our vital interests.

2. *Sugar.*—It is especially important that no sugar should be exported. The sugar industry obtained from the Government a relaxation of the prohibition in the sense that export should be permitted, deciding from case to case up to the amount exported in the year 1913—viz., 1·1 million tons. But no consideration for the financial circumstances of a particular industry should result in our sending useful food out of the country. Rather the people should be encouraged to increase their consumption, which would use up the available supply if it reached the American count of 36 kilos. per head of population, and this is less than the English figure of 40 kilos. In 1904, when the price of syrup sank 29 per cent., the consumption of sugar increased rather more than correspondingly—by 34 per cent., in fact. This increased consumption of sugar can then partly make up for the shortage of fat. This consideration alone should suffice, but as a matter of fact of the 1·1 million tons 0·8 went to England, whether directly or indirectly, through neutral countries. The keeping up of the level of German exchange in neutral markets is a matter of entirely subsidiary importance. In consideration of all this the Government has already agreed to withdraw part of the concession from the sugar industry.

Chapter VII. is concerned with matters relating to

Agriculture.

1. *The crops to be chosen.*—The necessity is clear; we must not allow the deficit due to failing imports to be increased by lack of production. On the contrary, we must increase the home crops, and as far as possible such crops as yield a high proportion of proteid food. In this respect the pulses are almost equal to meat. On the average of the years 1912–13 we imported 251,000 tons peas, 31,000 tons beans, and 28,000 tons lentils, and the farmer should attempt to produce these at home, naturally with some care, as these crops are more dependent on local conditions than others. It has further been proposed to let the place of potatoes and beet to some extent be taken by the culture of corn. Imported wheat to the extent of 2,000,000 tons has fallen out, and although this may to some extent be replaced by the 600,000 tons of rye which we no longer export, a deficit still remains which might be made good with the 1,100,000 tons of beet sugar which have been hitherto exported. But the suggestion is inadvisable on two grounds: firstly, the beet and potatoes yield far more per unit of area than corn, both in value and in foodstuffs, and they deplete the soil far less in respect of nitrogenous constituents. They afford, too, fodder for more and better cattle, which in their turn yield more and better manure for the land. And secondly, the intensive culture of these crops exerts a much healthier influence on the agricultural industry in general, on the breeding of heavier horses and stronger oxen, on the manufacture of agricultural implements, and has produced an enormous increase in freight on canals and railways, thereby assisting in high degree the finances of the State.

2. *Seed corn.*—It is of the utmost importance that sufficient seed corn should be available for the spring sowing. First of all for summer grain. The limitation of available labour has in many places hindered the sowing of the winter crop, especially in East Prussia and Alsace-Lorraine, and consequently the summer crop must be largely increased. Where an oat crop is doubtful barley can be used to take the place of the imported barley for fodder. In all cases the right sort of grain must be carefully chosen in advance. Of pulses there is a risk that the available stock may all be used up by the spring. Similarly clover and grass seed must be obtained, and all this can only be done by the organisation of the State itself.

3. *Labour and traction.*—The lack of labour for the harvest has made itself less felt in the autumn than was feared. The superfluous industrial workers will gradually filter into agricultural channels, and the great number of prisoners of war—now much over half a million—will provide many well-trained agricultural labourers. The lack of beasts for traction is not so great as might appear at first sight. Some half a million horses have been claimed by the army and the import of some 130,000 horses has stopped. Since the total number is somewhat more than four and a half millions, this means a reduction of some 14 per cent. But the earlier breaking-in of the foals has already almost compensated for this, and not only oxen and bulls, but also cows, can be trained for ploughing without harm if their diet is increased by so much beet and potatoes. Steam and motor ploughs can be used more than is the case at present, and the greater landowners must lend them to the smaller ones in their neighbourhood. The hundreds of motor ploughs stored in the manufactories must also be put into use. For

steam and electrically driven ploughs there will be no lack of power; for the motors the supply of petrol may be replaced by benzol, which is a by-product in the manufacture of coke. The latter should be used as fuel, not only in the household economy, but also in the locomotive, and the price reduced to this end. Spirit was used extensively for motors during the first months of the war and may continue to be so used with the addition of a moderate quantity of benzol. Comparing the consumption of foodstuffs required to produce the alcohol for motors with that of oxen for traction the figures work out as 391 kilogrammes of starch for 28 oxen per day and 300 kilogrammes of spirit for a motor plough per day. The advantage rests, therefore, with the plough, which further only requires two hands, whereas 28 oxen necessitate at least seven labourers. The motor plough is essential in places where there is a lack of beasts.

4. *Manures.*—In order to produce a good yield sufficient manure is essential. Much more attention should be given to the storing of manure in order that the available nitrogen should not be lost. Various calculations have been made that the usual loss is some 30 per cent., or a yearly waste of at least 600 million marks (= £30,000,000) for the whole of Germany. The money value of this loss is some five or six times as great as that of imported saltpetre, and is about equal to the sum which German agriculture pays altogether for artificial manures. Little or nothing can be done with the various chemical preservatives, but since the loss is due to the activity of micro-organisms, and most of these require atmospheric oxygen, it can be prevented by avoiding access of air and keeping the dung firm and moist. Even so a loss of some 13 per cent. occurs. By covering with peat it can be still further reduced to 7 per cent., and a similar saving is effected by keeping the solid and fluid parts of the dung separate according to Soxhlet's method. Not less importance is due to the artificial manures. To them is largely owing the rise of our agriculture. In the last 30 years our harvests of grain and potatoes have kept pace with the increase of population. This has, in the first place, been due to the introduction and use of artificial manures; secondly, to the better results of plant breeding, the better working up of the soil with manure, the keeping down of plant disease, &c. It has been estimated that of these various factors the artificial manure is responsible for 50 per cent., more fruitful kinds of seed for 30 per cent., and other measures for 20 per cent. of the advantages gained. Four substances have to be considered: nitrogen, phosphoric acid, potash, and chalk, of which only the first three offer any difficulties to produce. Amongst them nitrogen is vastly the most important. A series of important experiments in various parts of the country by Hansen, Schultze, and Lemmermann have shown that without the nitrogenous element all other manure is of very little avail. In Germany potash is present in abundance, and only the difficulty of freight may hinder its sufficient use. The State must come to our aid by reduction of freight rates, and will be later on compensated by the increased freights for the crops themselves. The supply of phosphoric acid depends on the Thomas-slag, which is itself dependent on the iron industry and the needs of the army. To produce the superphosphates the supply of crude phosphate may be supplemented from Belgium, where such beds are present in the provinces of Liége and Hennegau. The necessary sulphuric acid to work up the crude phosphate into superphosphate has been much reduced by the loss of the imported pyrites. There are beds of sulphur-containing rock in Germany—for instance, at Goslar—the working of which would supply the necessary sulphur. In spite of everything that can be done there will still be a certain diminution in the supply of phosphoric acid, which should, however, not make itself perceptibly felt at present in view of excess of supply in the last few years. Immensely more important is the obtaining of sufficient nitrogen. It has been calculated that 8,000,000 double centners (a double centner = 100 kilos.) of nitrogenous salts less than usual are available, and that for each nitrogen unit lacking, 3½ to 4 units less of grain will be produced by the fields. Thus an amount of 28–32 million double-centners less corn will be produced—i.e., about one-fifth of the total harvest. In 1913 more than half a million tons of Chile saltpetre were used as manure. The place of this can be taken by applying the nitrogen of the air with the aid of arc lamps, but the quantity so far has been minimal—38,000 tons in 1913. Next to saltpetre the most important manure is ammonium sulphate, occurring in large quantities as a by-product in the distillation of coal. Its nitrogen content exceeded that of Chile saltpetre in the year 1913, and the quantity has increased since. Lastly, calcium nitride is produced by the action of nitrogen on calcium carbide, and this production increases from year to year. As along with the Chile saltpetre about one-half the available nitrogen has fallen out, the other sources must be stimulated to the utmost extent. The great electrical works of Germany possessed in 1913 some two million horse power, of which on the average only 18·8 per cent. were used. Technically it would be possible to produce enough calcium nitride by means of this power without interfering with the ordinary supply of electricity. The State must take this important matter in hand.

5. *Culture of moors.*—According to Fleischer we possess in Germany about 20,000 square kilometres of unused moor land which can easily be brought to useful cultivation by the addition of suitable manures. Half of this area probably requires only a supply of potash and phosphoric acid, possessing already sufficient nitrogen. Especially the Russian prisoners of war are agricultural labourers and could carry out this useful work to great advantage. When one considers that the hektar (1 hektar = 2½ acres) of improved moor yields a certain harvest of some 20–30 double-centners of rye or oats, or 180–220 double-centners of potatoes, or 50–60 double centners of valuable hay, or on grazing on 3–4 double-centners of living cattle, the value of this work may well be seen. The latest experiments have shown that vegetables especially flourish on such a soil, especially with hand spadework, which is available in sufficient quantity with the help of the prisoners of war and the out-of-works. The stretch of country on each side of the Hamburg-Bremen Railway is particularly suitable. Further increase of harvests could be attained by extending the area of sewage works in the neighbourhood of large towns. These are mostly far too small and suffer from excess of effluents. Finally, an increase in agricultural production could be attained by dividing up large tracts amongst peasant proprietors, who would then carry out more intensive culture of the smaller areas. In this direction also, when the war has carried off so many owners of large properties, or made it impossible for them to conduct them further, the State must intervene.

Chapter VIII. deals with questions relating to

Live Stock.

1. *The reduction in the number of pigs and milch cows.*—"One thing must under all circumstances be done—reduce the number of beasts." A great quantity of imported fodder is lacking, especially barley, maize, bran, and oil-cake. So far these have partly been used for feeding pigs, partly for increasing the yield of cows' milk beyond what could be attained with home fodder. We should only add to our deficit if we were to replace this fodder with material such as corn, which could be used directly for human food, for, passed through an animal, more than half the nutritive value is lost. In addition we are obliged to deprive the cattle of some of the foodstuffs suitable for human food with which they have hitherto been fed. The Government has therefore forbidden under penalty the use of bread corn as fodder, amounting in rye alone to 2,000,000 tons yearly. We must in future divide the available fodder among a smaller number of beasts, for it is in general more advantageous to feed a small number abundantly than a larger number sparingly. The mere limitation of the number amongst which a given amount of fodder is divided makes it possible to produce more human food for the same consumption of fodder, and therewith further limiting our deficit. The necessary reduction of the number of beasts demands, on the one hand, a slaughtering of a certain proportion, and on the other a limitation in the production and breeding. It will be readily understood that the thought of such a reduction will be very sore to the heart of many of the farmers who have attained a large stock with years of hard labour, but there is no place for sentiment in the present fight for existence. Only we must see to it that the diminution does not damage the future of the industry, and that on the return of peace the breeding can be resumed in the necessary intensity. These questions are not simple of solution, the first being in what kind of animal the diminution shall be made. Here two points must be considered, the first concerning the kind of fodder. In general the reduction should be made among the

beasts who consume fodder which could directly serve for the food of man. The pig is the greatest food competitor of man. The second point concerns the best employment of the fodder. We should rather destroy such beasts as do not put the fodder to an economical use. In this respect the varying production of meat and milk is of special interest. The experiments of Kellner and König have led to the following results. In the feeding of a pig of 15 kilos. up to a weight of 120 kilos. 24 per cent. of proteid and 44 per cent. of total food value is retained for the nutrition of man. On the other hand, in rearing a calf from 30 kilos. up to a weight of 360 kilos. only 20 per cent. of proteid and 14 per cent. of total food value is available. A milch cow weighing 500 kilos. and giving in the year 2200 litres of milk gives back to man 36 per cent. of the proteid and 24 per cent. of the total food value with which it is supplied. The different value of the products must also be considered. With milk at 20 pf. (= nearly 2½*d.*) the litre and pork at 2 marks (or shillings) a kilo., we pay for 100 grammes of proteid 57 pf. in the case of milk and 1 mark in the case of pork; and apart from proteid the milk contains far more nutriment than the pork. In proteid economy, therefore, the milch cow is far to be preferred to the pig or the calf. Hence the cow should be retained as far as possible and only the wasteful feeders destroyed. If the question of the economical employment of fodder were the only one, then the bullocks should principally be destroyed. But since the kind of fodder is of still greater importance the limitation of pigs is the first to be undertaken.

2. *The degree of the limitation of the number of beasts.*—The reasons making the limitation necessary are the lack of imported fodder and the prohibition of the employment of bread corn. Both necessitate a diminution, since it would be indefensible to maintain the present number with insufficient and therefore unproductive feeding. Two methods are available to determine the necessary reduction. In considering the measures for the whole country the calculation can best be made from the quantity of fodder which is no longer available, whereas for any particular district or farm the calculation must of necessity be made on the actual figures of fodder still available. First, then, let us consider in what degree in general the number of cattle must be reduced. The missing fodder was principally used for two purposes: for the feeding of pigs and the keeping of milch cows. Roughly, we may assume that barley and maize were given to the pigs and the other fodder to the cows. On this basis we may reckon that pigs were fattened on the excess of imported barley and maize as far as this served for fodder at all. On the average of 1912–13 2·9 million tons were available with a proteid content of 240,000 tons. To see how many pigs this amount could have fattened it is not possible to calculate simply from the physiological fact that a pig in order to increase from 15 to 120 kilos. in nine months requires fodder of 1·4 million calories, equivalent to 493 kilos. of barley or 411 kilos. of maize; for this calculation does not allow for loss on transport and storing, for waste in feeding, for digestive disturbances and disease, and death during fattening. It is better to reckon as the practical farmer does that a pig puts on a kilo. of weight for 5 kilos. of corn (5½ kilos. of barley and correspondingly less of maize). If the fattening of a pig is expressed in this way in corn value, 525 kilos. (or 575 kilos. of barley) would be necessary, giving roughly 5½ millions of fattened pigs, or somewhat more than a fifth of the last census. The reduction should specially be made in the pig-fattening establishments of the province of Hanover.. For milk production we should have—on our basis of calculation—to allow for the lack of import of fodder, as well as the home rye which is no longer available for animals. The import reckoned in proteid value amounted in 1912–13 to 664,000 tons, the home-grown rye to 192,000, of which only the bran (some 50,000) is now available. The total deficit for milk production is therefore 806,000 tons of proteid. Now, a cow gives on an average 2200 litres of milk in the year, and requires as fodder for its own needs on the usual calculation 350 grammes daily, or 128 kilos. yearly, of proteid, and in addition as fodder for the production of milk 70 grammes for each litre, or 154 kilos. in the year. Adding these together, each cow requires 282 kilos. proteid per year. 806,000 tons of proteid content in the rye no longer available would have served to feed 2·86 millions of milch cows, or some 27 per cent. of the whole head of cattle. This calculation, however, gives only a provisional picture, for the entirely incorrect assumption has been made that farming methods would continue as heretofore. This must not be allowed to occur. Fodder must be economised and new sources utilised; suitable additional fodder plants are to be cultivated, useless cattle got rid of, the waste of raw fodder avoided, and the cattle treated according to their individual needs. It has been calculated that with economy of the use of fodder in every possible direction a saving might be effected, so that only 2 million cows need be got rid of. But this is without allowing for a limitation in the keeping of pigs, and, as we have seen, the proteid of fodder is obtained in almost twice the quantity in milk that it is in the production of pork. For every three and a half pigs destroyed one cow may be retained, and we may accordingly compromise by reducing the number of pigs by 9 millions, the milch cows by only 1 million, respectively 35 per cent. and 10 per cent. of the whole.

3. *The carrying out of the reduction.*—In different parts of the country different conditions as regards fodder prevail. In any case those cows should be slaughtered in which the milk production is less advantageous, and even then not all at the same time, to avoid a temporary excess of meat at a low price and an eventual meat famine. The State should here again step in to buy and preserve the surplus meat, and a minimum price should also be fixed. As regards the production of pigs, so long as the skim and butter-milk cannot be otherwise employed they should be retained, and for the present the potato harvest cannot be otherwise utilised, especially since the slaughter will be a successive one and the feeding of young pigs must in any case not be too scanty in order that they may remain capable of adequate fattening.

4. *Small livestock.*—The proposal has been made to extend as far as possible the keeping of fowls and rabbits, thereby producing a more varied and agreeable diet, which would be of practical importance with foreign production entirely cut off. But although for years fowl-keeping has been encouraged, in the first half of the present year over 106 million marks' worth of eggs were imported into Germany, and this condition is hardly likely to alter rapidly. The rearing of chickens also involves foodstuffs which might serve directly for human consumption, and the question is in fact only a practical one where the fowls can run free in the farm and on the fields and feed on insects, worms, plants, &c., which otherwise would remain unused. The amount of care and attention required would often be prohibitive, especially when so large a proportion of the population is on military service. But wherever possible the keeping of fowls should be borne in mind.

5. *Increased production of fodder.*—The leaves of beet and potatoes if carefully harvested and preserved afford useful fodder, and a great part of the green stuff which is usually ploughed in may also be used as well as crops grown in the between-time of the principal crops, such as Chinese radish, white mustard, peas, &c. These measures were already recommended at the beginning of the war by the Agricultural Society and by experienced farmers.

Chapter IX. deals with

The Proper Utilisation of Agricultural Products.

1. *Corn and potatoes.*—Much can be done to cover our deficit by employing grain and potatoes to proper advantage. They belong together because they are commonly employed for the same purpose, whether for human nourishment, fodder, preparation of starch, or brewing. At present both are largely employed for feeding domestic animals, and this is not so questionable in the case of potatoes, of which we have a large excess. Of grain hitherto, not merely the residual grain—i.e., the part cast aside with the impurities on sifting—has been employed, but also some proportion impossible to estimate even of good grain among the smaller farmers. Such grain, employed indirectly for human nourishment through an animal, loses at least 50 per cent. of its food value. 1·4 million tons of corn are lacking, and in these circumstances the use for fodder must be limited to a minimum. The Government indeed on Oct. 28th, 1914, forbade its use on principle. "For every farmer it must be a matter of honour to observe this prohibition in the interest of the protection of his country." Fortunately a substitute can be found. More potatoes can be used, especially when by means of potato-drying large

quantities are preserved from rotting. Beet parings can also be used. These substitutes can gradually take the place of the usual rye.

Considerable quantities of grain and potatoes are lost for human food by their use in trade. Even if the substitutes produced are used for food a certain loss is inevitable—in the processes of starch-making and brewing—apart from the starch and spirit which are used for trade purposes. These uses must be carefully inspected. Starch is partly used in the kitchen for baking, partly for technical purposes, and is produced both from grain and potatoes. In the year 1911, 34,000 tons of rice, 25,000 tons of maize, and 23,000 tons of wheat flour were used. The two former are no longer available; hence there is a risk of wheat flour being used in their place. In preparing starch from corn the proteid content is lost, or has at all events not yet found adequate employment (so-called aleuronat has had no great success). For all purposes, whether of food or industry, wheat starch may be replaced by potato starch, which has the great advantage of not wasting any large proteid content. In 1910–11, 1·3 million tons of potatoes were used for starch, with the obvious advantage of producing a foodstuff capable of indefinite keeping, bearing in mind that the best form of preserving potatoes—viz., drying—is not possible for the whole quantity. The production of potato starch, if it is used for human food, is therefore free from drawback. If used for bread the proteid content of the latter will be diminished, and its place must be taken by adding skim milk. Zuntz and Magnus Levy have shown that such bread is well digested. Technical application of starch, on the other hand, must be limited. The employment for linen has no real use, and some ingenious person should discover a substitute for paperhanger's paste.

For the production of alcohol both grain and potatoes are used. In the years 1912–13, 3,000,000 tons of alcohol were manufactured. About half is drunk; the other half is used for various technical purposes. 89,000 tons of rye were used in the production of malt spirit. This employment is highly questionable, and the production of spirit from corn should be entirely forbidden. Of potatoes in the years 1912–13, 2·7 million tons were used in the distilleries. Against the use of potato spirit as a beverage the reduction of food value is not as great as might be supposed. 60 per cent. of the energy remains in the form of alcohol, 3 per cent. is lost in the vital process of the yeast, and the remaining 37 per cent. forms a useful fodder, of which in its turn one-third is later availeble in the form of meat and fat. Potatoes used directly for cooking as a rule lose 15 per cent. in peeling and 2 per cent. in imperfect digestion. Hence, *quâ* food value there is not much against the distillery. But in spite of this the use of alcohol should be limited as much as possible, as it is a poison and a danger to the health of the individual as well as to that of the community. Other considerations affect the part of the alcohol used for technical purposes. It is entirely lost as food, with the exception of the small residue for fodder. The use of alcohol for motor driving is an evil which cannot be altogether avoided, although it should be limited as far as possible. As an illuminant gas, acetylene, or electricity must take its place. Its use to replace benzine and petroleum is, to some extent, unavoidable, and any reduction in the production of alcohol from potatoes can hardly be expected. For brewing grain alone is employed, and in the form of beer our population enjoys more alcohol than in the form of spirit. In the years 1912–13 3·5 kilos. of alcohol yearly per head of population were consumed in the form of beer, and 2·2 kilos. in the form of spirit. Some 1·7 million tons of barley served for this purpose, and the question whether limitation is desirable is affected by the fact that barley ordinarily is very little used for human food. In brewing the nutritive value is fairly well maintained and an average loss of 12 per cent. may be reckoned with in malting and a further loss of 25 per cent. in extracting from the malt is compensated by the value of the remainder as fodder. A further 2 per cent. is lost in the vital process of the yeast, which itself, however, serves a useful purpose in baking. Hence, some 60 per cent. of the energy of the barley is retained for man in beer. Even in the production of pearl barley some 40 per cent. of food value is also lost.

The most important employment of grain is naturally the production of bread, and since the import of wheat and the export of rye both have ceased it is necessary to mix rye flour with wheat, and an edict on Oct. 28th made an admixture of at least 10 per cent. of rye flour obligatory. To raise the price of wheat flour as a further inducement to saving would have the undesirable result of limiting the use of wheat flour to the well-to-do. The necessary regulation is gradually coming about and bakers should be encouraged to make the small rolls out of rye flour. The question is, further, of great importance whether the quantity of bread can be increased by a large addition of bran, bran being the part of the outer husk of corn separated in the grinding, and containing much proteid but in an indigestible cellulose envelope. Wholemeal contains the whole of the bran, the finest wheat flour about 60 per cent. of the total weight. Between these two extremes it is possible to manufacture a bread containing 70, 80, or 90 per cent. of the total weight. The separated bran, if employed for human consumption through an animal, loses at least 50 per cent. of its total value. On the other hand, if the whole of the bran is employed the resulting bread is not so perfectly digested—as, for instance, in the well-known pumpernickel. These considerations influenced the edict of Oct. 28th, according to which rye flour must contain at least 72 per cent. and wheat flour at least 75 per cent. of the total weight. The much-discussed question whether potato bread—i.e., bread with addition of potato flour—is advisable or not was settled also by the same edict, which prescribed an obligatory addition of 5 per cent. of potato flour to rye bread. A larger addition is permissible, but the bread must then bear the letter K (Kartoffel); if more than 20 per cent. the percentage must be stated on the bread. The production of potato bread is not necessitated by the lack of corn, but because grain is more easily stored than potatoes. On principle, however, it is doubtful whether the composition of a staple article of diet like bread should be altered after centuries of constant use, and when many people cover the whole of their proteid requirement in the form of bread. Potatoes contain less than one-fifth part of the proteid of rye flour. The addition of 5 per cent. is free from objection; more than 20 per cent. is inadvisable, especially as, according to Hellsten's experiments, digestion is then less perfect. Moderate saving of food value might be attained by dispensing with yeast. The alcohol and carbonic acid lost in the fermenting of the dough amounts to some 2 per cent. of the food value. But the employment of baking powder or of mechanical means is technically very difficult.

The complete utilisation of potatoes is endangered by the fact that a part of their food value is lost by rotting during long storage. In a year some 4 million tons are wasted in this way. Much may be done by correct storage, and latterly the practice of drying has helped considerably. In one form whole potatoes are cut into slices and dried in an oven, the resulting material being used for fodder. In a second, potatoes are steamed, freed of their peel, and pressed between rollers into thin discs. Although mostly used for pigs, they are then quite suitable as human food. A special advantage is the reduction in weight for transport to about one-quarter. Unfortunately the existing apparatus working continuously can only dry some 2½ million tons during the present winter.

2. *Vegetables, fruit.*—A not inconsiderable increase in our food-supply can be reached by better utilisation of vegetables and fruit. The edible fungi should not be wasted, and for vegetables four methods of keeping come into question: storage, pickling, drying, and preserving. Cabbages especially, instead of being sold almost for nothing in the autumn, should be stored in frost-free rooms which the local authorities and coöperative unions should provide. There is a larger field for the production of sauerkraut and the pickling of beetroot. The drying of vegetables is more complicated, but more might be done in this way as well as by sterilising in tins and glasses, which is, however, both expensive and complicated. Especially in individual households much can be done. The same applies to fruit. Home-grown garden fruits have by no means been used to full advantage, and there has specially been a lack of an organised market for windfalls and the cheaper kinds of fruit which have generally been given to pigs. The wild fruits—bilberries, blackberries, hips, elderberries, &c.—should not be imported but diligently collected in our own country, and a market organised for this purpose.

Preserving with sugar is most desirable, as in this way an increased employment of home-grown sugar would result. As an addition to a dish of cereals and potatoes they will serve greatly to limit the consumption of meat.

3. *Sugar.*—An attempt must be made to utilise properly the million or so tons of sugar which will no longer be exported. First and foremost is its employment to preserve fruit, and the transport tariff to the manufactories should be correspondingly reduced. It is clear that even after the war English markets for our sugar are by no means assured. The surplus may be employed as fodder, and especially to make palatable to the beasts forms of fodder which would not otherwise be so, especially the beet parings, and also straw, chaff, &c. The sugar would mostly be in the form of molasses, the residual non-crystallisable remains from the manufactory. Whole beetroot cannot in large quantity be given safely as fodder, and for 1000 kilos. of milch cow it is only advisable to feed some 10 kilos. of beet, for cattle 15 kilos., for horses 8 kilos., and for sheep 25 kilos. Their employment is safest for pigs, but their use should not then exceed 25 kilos. for 1000 kilos. of living weight, and it must be borne in mind that extra proteid must also be given. As beets are heavy they can only be given within short distances of where grown, and in any case the economy of the 300 old sugar manufactories which employ a large number of workmen should not be seriously interfered with. In some factories already some 20 per cent. of the sugar is left in the peeling, which then forms a simple and economical fodder.

4. *Milk.*—Milk is a product which if carefully utilised will form a considerable gain in our food-supply. Before the war annually some 20 milliard litres of cows' milk were produced, not allowing for what the calves themselves took. A reduction of 10 per cent. in the head of stock has been contemplated, with a corresponding reduction of about 18 milliard litres. At the present time two-fifths are used directly as full milk, a small part made into cheese, and more than half into butter. A considerable loss of food value occurs in the latter process. The whole content of carbohydrates and proteid goes into the skim and butter milk and the whole of the fat into butter. The figures for milk are roughly 3·5 per cent. fat, 3·2 per cent. proteid, 4·8 per cent. carbohydrate; and since the fat is double as rich in calories as the other constituents, the larger part of the energy-content is found in the butter. Nearly the whole of the body-building material is found in the skim milk. On present lines 8 or 9 milliard litres of skim milk are produced, and it is clear that this may have an enormous application in covering our proteid requirements. Unfortunately at present skim milk is only used in small proportion for home consumption. Its only large employment is to make skim cheese, whether curd or in more permanent form. A further proportion is used in margarine fabrication, where only a portion of its food value remains in the margarine, the rest going for pig fodder. As a drink both skim milk and butter milk are used very little, and in the raw state it is especially prone to carry tubercle bacilli and should only be used in a pasteurised or sterilised condition. But in cooking, where it might be largely employed, it is at present little in vogue. This is partly owing to the excessive consumption of meat and to ignorance on the part of the housewife of the use of skim milk, and also to its relatively high price. In consequence of this at present the skim milk is yearly to the extent of 5 milliard litres given to pigs, entailing, as we have seen, a reduction of at least 50 per cent. in its nutritive value. Careful instruction in its use should be given to housewives, the railway must assist by low tariff, and the price fixed at less than one-half of that of full milk. Further propaganda should be made for the larger employment of cheese both taken alone and as an addition to other foods, thereby saving the consumption of meat. But the third and most efficient means for preventing the loss of nutritive value, at present due to skim milk, is the limiting of the production of cream and butter corresponding at least to the reduction of 10 per cent. of the total quantity of milk. On the other hand, the proportion of full cheese should be, if possible, extended. Its value as an article of food is considerably higher than that of butter, and it has the advantage of greater permanence and easier transit. As the desirable consumption of full milk can hardly be increased it must be reserved as far as possible for the children. The matter may be summarised as follows: "Full milk is to be retained in its present quantity, a production of cream and butter is to be limited, cheese is to be produced where possible in increased quantity. From the skim milk remaining after making butter, cheese (curds and skim) is to be made as far as possible, and the direct use of skim milk is also to be encouraged by propaganda and by cheap prices."

5. *Meat, fat.*—We must reckon with the fact that in the immediate future the number of pigs must be reduced by one-third and that of milch cows by one-tenth. In consequence of this the amount of meat on the market will immediately be increased, and if this is not to be followed by a subsequent meat famine immediate measures must be taken. The slaughtering must not be done all at the same time, and full advantage must be taken of the use of cold storage, smoking, pickling, and the production of dauerwurst. It would be especially advisable for the farmers themselves to prepare, as in old time, their own hams and bacons. If necessary the local authorities and the State must step in and buy up and preserve all the superfluous meat. The use of fat for technical purposes must be limited as far as possible. The employment for soap manufacture of fats, which could be used for human consumption, must be forbidden by the State. The soap manufactories can use the effluents of towns, as is already to some extent being done, and a house-to-house collection of waste fat is also possible. The addition to soap of substances which clean mechanically is also to be considered. Apart from soap, other industries must forego entirely the use of such fats.

Chapter X. considers

The Necessary Alteration in Habits of Life.

1. *More vegetable food.*—Even an isolated Germany can cover its requirements in foodstuffs, but to do so without too much limitation various adaptations must occur both in our agricultural production and in the proper utilisation thereof. Production and trade doing their part a moral duty rests with the consumer to do his, and to demand those foodstuffs, such as rye flour, sugar, and skim milk, which are at present in excess. The consumer, therefore, is entrusted with the great task of defeating the English starvation plan. The most pressing alteration demanded is to diminish the consumption of proteid and fat in comparison with that of carbohydrates, approaching more the habit of the country dweller, especially in South Germany. In wide circles, especially in towns, proteid has been consumed in excess in the form of meat, and we must reckon with the meat-supply becoming short after an initial glut. This reduction in itself is not an evil. The consumption of meat has increased enormously during the nineteenth century, as the following table, giving the relative consumption per head of population, shows:—

Year.	Kilos.	Year.	Kilos.	Year.	Kilos.	Year.	Kilos.
1816	13·6	1861	23·2	1883	29·3	1900	43·4
1840	21·6	1873	29·5	1892	32·5	1907	46·2

In the last ten years the consumption of meat has remained about the same, although it doubled during the previous 50 years. We can return to the habits of our forefathers in this matter without concern, and in so doing become healthier and live more cheaply. Fat also in the large towns has been used very abundantly in the form of bacon, lard, dripping, margarine, butter, and cream. Since in the rôle of nutrition it differs only from carbohydrates in a larger heating value—40 grammes of fat corresponding to 90 grs. of carbohydrate—we have only to replace this use of fat by more carbohydrates, such as bread, puddings, soups of various kinds, potatoes, sugar, &c., and this can and must be done. Fat will soon fail. The foreign animal fats—e.g., American lard and Siberian butter—are wanting, and also the fodder with which we have heretofore produced the home animal fats, especially oilcake, barley, and maize. We also lack the foreign vegetable fats which serve for artificial butter. An increased production of linseed oil and new sources, as, for instance, beech nuts and sunflower seeds, may help a little but not seriously affect the problem. Such a high consumption of fat is, however, as unhealthy as it is uneconomical. In contrast to most carbohydrates the pure fats are poor in other materials, especially in salts; and, by reason of their difficult digestion and lack of tempting flavour excite the consumption of alcohol, and are therefore hygienically questionable. Economically they are wasteful, as so much is lost on plates and dishes after becoming cold, as is shown by

Rubner's observation that 100 grammes a day are thrown away in Berlin per family. We must therefore use less fat and more carbohydrate, and since the animal foodstuffs contain more of the former and vegetable more of the latter the necessity arises of living more on vegetable substances. This is not a recommendation to pure vegetarianism. To give up animal food altogether would be economically a mistake, as the beasts consume stuffs unsuited for human food—e.g., hay, straw, greenstuff, acorns, beet parings, &c.—and these can only be made suitable for human food by being employed as fodder. We should only return to the habit of former times in which vegetarianism had no meaning, because the employment of meat and fat had not then reached such a high level. In a large part of South Germany the carbohydrates still form the principal part of the diet, and the necessary alteration for North and Central Germany consists in introducing South German dishes. The alteration should not be made too suddenly, and the State and local authorities should see to it that the prices of animal foodstuffs gradually rise, and so assist the gradual taking place of the change.

2. *Meat, fish; milk, cheese, skim milk; pulses.*—The body's need in building material—i.e., in proteid—will also be in part covered by the proteid content of bread, and in smaller degree of potatoes; and since these foods are taken for their carbohydrates in large quantities no inconsiderable amount of proteid is also taken. But to cover the whole proteid need excessive quantities of these would be required, and hence we do well to cover a part of our proteid requirement by foodstuffs containing a high proportion of proteid. There are three groups of these: (1) meat and fish; (2) milk and milk products; and (3) in the vegetable kingdom only the pulses.

The consumption of meat is very various in different parts of Germany. In some, especially in South Germany, little meat is taken—in the country for the most part only on Sundays, but in cities, and especially in the hotels and restaurants, the consumption is excessive. Excessive also is the so-called English breakfast, beginning the day with abundant quantities of meat, &c., and the employment of meat at the mid-morning lunch, to which even town children are accustomed. Wherever the employment has hitherto been within moderate limits it may be so continued. Meat remains to us permanently in various forms. In addition to beef, pork, and mutton, there is also available horse, game, poultry, rabbits, and, as fish may also be included under meat, both fresh water and salt fish, especially herrings, haddock, and cod. One of the cheapest sources of proteid is dried fish, and fortunately the herring catch of last year was a good one. Fish is especially useful in bringing variety into the diet of the poor. In hotels and restaurants part of the meat should be exchanged for fish, and for children meat is better replaced by milk and milk foods up to school years.

By far the most important substitutes for meat are milk, cheese, butter milk, and skim milk. Milk plays a special rôle among all foodstuffs, since, as the natural food of the young, it covers all that the body requires in each category of foodstuff. The consumption of butter should be limited, since it leads to a waste of skim milk used as fodder, and so to a large proteid loss. The consumption of full milk can hardly be increased, but should not be reduced; a certain redistribution should take place; employment for children instead of meat, skim milk taking the place of full milk for cooking. The consumption of cheese should be increased. Full cheese is, so to speak, concentrated milk, containing in convenient form practically all its valuable constitutents, and it is more nourishing than moderately fat meat. It has the advantage over milk of appetising flavour, and for many people of greater digestibility. Milk costs in food value only about one-half of meat, and full cheese such as Tilsit, is cheaper even than milk on account of its convenient transport and keeping property. More important still is the production in future of skim cheese in larger quantities. As soon as the knowledge is general that with its proteid content and appetising flavour it is a cheap substitute for meat, bread and cheese will often take the place of bread and sausage. Unfortunately the use of curd cheese is limited. In contrast to full cheese, curd cheese has little flavour, but is on this account the more suitable for the preparation of breakfast and supper dishes even for children. It is especially suitable for use in cakes and puddings, and already figures extensively in the South German and Austrian menu. Of great importance, too, is the use of skim milk to replace meat. As a beverage it has little vogue, but can often take the place of full milk in cooking and baking. In preparation of foods the taste is indistinguishable from that of full milk, and puddings are an excellent food for children and also for adults on days when meat is not taken. The greater employment of puddings, which by their content in skim milk, sugar, and flour replace fat, is not only a resource in time of urgent need, but a means of permanent importance for the nutrition of the people.

Lastly, as meat substitutes we have the vegetable products which are rich in proteid. Amongst these, far the most important are the pulses—peas, beans, and lentils. Their proteid content is equal to that of meat, but in consequence of the hard husk is much less digestible than that of meat or milk. But cooking can largely remedy this, especially in the case of peas, and they are therefore a cheap substitute for meat and should continue in use even with a rise of price. Nuts, chestnuts, and fungi, although rich in proteid, are of much less importance on account of their hard envelope.

3. *Bread, porridge, puddings, potatoes, vegetables.*—The body's need in energy-producers can just as well be covered by proteid and fat as by carbohydrate, but since we have to reckon in the future with a certain lack of the former, we must largely cover our need with the latter, and here starch-containing foodstuffs have the chief place—bread and other products of flour, potatoes, and vegetables. Taking bread first, the important matter is to add more rye and less wheat. Two million tons of foreign wheat have fallen out, and home-grown rye is available to take its place. This is an easy adaptation, since there is no good ground for preferring wheat bread to rye bread. The latter has hitherto been baked chiefly in large loaves, but is equally suitable for rolls. Fine rye flour without bran is also available. The Government has already ordained that flour must contain a certain proportion of bran (rye flour 72 per cent. of the whole, wheat flour 75 per cent. of the total weight of the grain), and this can be increased somewhat with advantage. If rolls of rye flour are demanded the baker will undoubtedly make them. Rye flour may also be used with advantage in the form of macaroni, groats, semolina, porridge, &c. These do not lead to the addition of fat to the same extent as bread does, and are therefore specially useful under present conditions, and the addition of skim milk and sugar greatly increases their nutritive value. Especially for children they have great application, and can in this way spare for adults the meat and fat rations to which they have been accustomed, although for the latter also reduced meat consumption is advisable. In South German and Austrian menus they already play a large rôle at breakfast and supper, with the addition or not of a little egg. Of potatoes we now consume some 14 million tons in the whole of Germany yearly, and employ about double the quantity for other purposes. In South Germany the consumption of potatoes can be greatly increased with advantage. The great loss on peeling, amounting to some 15 per cent., or yearly to 2 million tons, should be avoided. To avoid this potatoes should be boiled first and peeled afterwards. The taste of peel so resulting can be avoided by dropping the peeled potatoes into boiling salt water for three minutes. When peeled raw the patent peeler should be used, and dried potato chips have considerable application. Potatoes should be employed in greater variety, not merely boiled or as salad but in the form of dishes with the addition of a little meat or fish, or with cabbage, fruit, &c. A special place is occupied by vegetables. The chief value of bread, puddings, &c., lies in their starch content. Vegetables also contain a certain quantity of starch, some also a little proteid, but their value in nutrition is chiefly due to other constituents. The mineral stuffs, especially chalk and iron, are of some value, but their chief use is as appetisers on account of their varied and agreeable taste, thus making more change possible in the diet, especially when this contains a large quantity of potatoes, and in so doing they further limit employment of fat.

4. *Fruits, sugar.*—The second kind of carbohydrates which must help us to cover the supply of energy-producers we find in the sugar-containing foods, especially in fruits and in the sugar which is obtained from beets. Fruits play a similar rôle to that of vegetables, although the sugar

content is 15 per cent. in grapes, 8 per cent in apples, but only 2 per cent. in whortleberries. Fresh fruits have the objection of not keeping, and preserving makes it possible to utilise the less valuable kinds and to store and transport them. The use of sugar must be largely increased, bearing in mind that in England and America it is twice as much per head of population as with us. In those countries preserves are largely used where we use butter. Exact investigations have shown that taking of some 12 to 15 grammes of sugar in half-hourly intervals can remove the sense of fatigue in very large measure. Hence, sugar in various forms should be part of the consignments to the troops in the field. The frequent assumption that the use of dry sugar produces thirst is incorrect; on the contrary, it produces increased salivation, and thereby moistens the mouth. The production of thirst is unthinkable, because in the oxidation of sugar in the body almost two-thirds of its weight of water is formed. No large amount of raw sugar can be taken, but it can be made up into cheap fruit preserves and various forms of cakes and sweet dishes and as an addition to soured milk. Sugar added to tea and coffee is no luxury, but makes the drinks nutritious. It must be borne in mind that sugar is merely a sweetmeat but weight for weight equivalent as a foodstuff to fine flour.

5. *Household economy.*—"Much should be otherwise in our nutrition. Vegetable food must take a larger place. At the midday meal the meat dishes should be placed in the background and various valuable puddings take their place. But it is a question not only of an alteration of the chief meals, but also of much else. Rolls should be confined to breakfast; at dinner and supper large loaves of rye flour or rye and wheat flour. The widespread but senseless luxury of eating bread between meals with a layer of fat should be given up. Bread alone is sufficient, or bread with fruit or marmalade. With fat dishes such as cheese or ham, buttered bread is entirely unnecessary." With the alterations recommended, our diet will not be monotonous but more varied. In many circles the present menu is poor in variety and it is only to be wished that particular dishes at present not enough valued should be introduced. The housewife must take care that the alteration of the diet should not produce disgust. Newly introduced sweet dishes should alternate with the more usual salt or acid ones, and excessive zeal may do great harm and only produce the effect of a hurried return to the old unsatisfactory diet. An important item is the home production of articles of diet. Even a small piece of garden can cover part of the requirements in potatoes and vegetables, and the keeping of animals must be considered. Pigs, goats, rabbits, and hens make it possible to use all the kitchen refuse, such as potatoes and withered vegetables. In most cases it will be possible to pickle and smoke meat and to preserve vegetables and fruit. Correct marketing must be practised everywhere. Where necessary articles such as skim milk, fruit, cheese, and rye rolls are not offered in sufficient quantity, they should be repeatedly demanded, so that demand may call forth supply. In general it is not advisable to store food, apart from some pickles and smoked meat, as well as preserved fruits and vegetables.

Finally, care must be taken that no waste occurs, as has been too much the case in all classes of society. Among the well-to-do too much has been eaten. Superfluous nourishment is partially undigested and floods the body to the detriment of health. But apart from this much goes bad both in the kitchen and on the table, and the value of refuse has been little recognised. All meat and fish scraps should be carefully utilised. They can be boiled and employed to flavour soups and vegetables. The remains of fats and sauces especially should be kept, as well as those of bread and potatoes. Waste of food may also occur in the use of spirit, starch, and soap, for the two former are made from grain and potatoes, while the latter is chiefly produced from useful fat. The spirit producers have recently pointed out that with the shortage of petroleum, spirit is a useful substitute. This is correct, but we should make as little use as possible of the substitute, since as spirit is produced from potatoes the burning of spirit is equal to the burning of potatoes. Wherever other illumination is available spirit should not be used. The same applies to starch, which is produced from potatoes, for although in the case of linen its use can hardly be avoided, for other articles of dress it should be given up entirely, as it is not only uncomfortable, but prevents the passage of air and is actually unhealthy. In a time in which it is necessary to economise our food-supply it is stupid to persist in so doubtful a fashion. Finally, in the washing of clothes soap should be sparingly used, especially as hard water wastes it in large measure. For one degree of hardness—i.e., 10 milligrammes of chalk in the litre of water—denotes for a hectolitre of water a loss of 10 grammes of the usual commercial soap. In a hard water, such as that of the Jura, the loss may amount to 350 grammes or more of soap for a hectolitre. In these regions it is advisable to use rain water, or, if this is impossible, to soften the water previously with soda, chlorine compounds, or perborates. Some saving of nutritive value is possible by the preparation of food in quantity, but, in general, cooking at home is both better and more economical. The self-cooker may render additional assistance. Where the housewife has to work outside the house a people's kitchen may then serve a useful purpose.

The Covering of the Deficit.

Chapter XI. treats of *results*, and contains the following interesting summary:—

Nutritive values.	Proteid in thousands of tons.	Calories in milliards.
Physiological requirement	1605·0	56750·0
Actual use before the war	2307 0	90420·0
Available if the present conditions remain unaltered...	1543·0	67860·0
To add: Alteration of cattle-keeping	217·3	2378·0
Avoidance of waste	80·0	5675·0
Prohibition of corn as fodder	78·3	2741·0
Increased use of skim milk and skim cheese	48·8	250·9
Potato-drying	18·9	1112·3
Limitation of butter production ...	14·8	110 4
Cultivation of moors	10·4	592·0
Prohibition of the production of alcohol from corn	4·7	68·6
Preserving of vegetables'...	3·6	93·0
Preserving of fruit	1·7	147·5
Prohibition of the production of wheat-starch	1·3	5·2
To subtract: Sugar used as fodder...	—	– 283·1
Available if the means recommended are carried out	2022·8	81250·8

"We see that the efficacy of the means recommended is great. The available amount of foodstuffs rises very considerably, the number of calories by 20 per cent., the proteid by 30 per cent. Our needs are covered also in regard to proteid, and in so large a degree that the losses involved in transit are covered. The available calories exceed our needs by 44 per cent., the available proteid by 26 per cent. Naturally it is inconceivable that without imports the same amount of nutritive value should be available as before the war, but an approach to this amount is obtained in calories, wanting instead of 25 per cent. only 11 per cent., in proteid instead of 33 per cent. only 13 per cent. of what was available before.

"This favourable result applies not only for the moment but permanently, even if the war should last for years. It has intentionally been left out of consideration what might cover our immediate needs, but is not assured for longer—both our reserve stores and our imports from neutral States. Indeed, the possibility has been reckoned with that during the war our production in food values may be still further diminished by bad harvests and other causes.

"The favourable result has not been assumed with thoughtless optimism, but has been worked out with gravity and foresight. In reckoning our requirement and our sources of help they have been assumed in general to be too low rather than too high. The requirement of the individual has been fixed as if the whole population were well whereas we have numerous sick people with reduced needs. For the needs of the whole people a census of 68 millions has been assumed, although the greater part of the army is on hostile land. Of the means for producing food-values there are many which cannot be expressed in figures—as, for instance, the internal colonisation, the increased cultivation

of pulses, the extended keeping of small animals—and for the remainder the smallest amount has always been worked out and stated.

"The whole favourable result naturally assumes that what is here demanded will actually happen, that the Government permit no export of foodstuffs, that the local authorities carry out strictly the prohibition of corn as fodder, and that the farmer sees that the head of swine are reduced by 9 millions, the head of milch-cows by 1 million, that the waste of fodder as well as of foodstuffs shall cease in our households, that a sufficient number of prisoners of war can be had for the culture of moors, and so on. But this assumption will be fulfilled.

"We shall come through. That we can do so we owe to our agriculture, under the mighty protection of our rulers, who with clear sight recognised the danger of a one-sided development of Germany into an industrial state, and with the able coöperation of prominent men it has in the last decades undergone a tremendous increase; to its own benefit, and with the gratifying result that we are in a position, in case of need, to nourish on an area of little more than half a million square kilometres 68 millions of human beings without import from abroad. To the healthy adaptability of our economical life we are also greatly indebted. As the individual adapts himself the more easily to a change in outside circumstances the better his nervous system reacts; so also the national economy shows a greater adaptive power, the more nervous force works in it in the form of strong, intelligent, thoroughly sound personalities. The richness of Germany in such personalities has shown itself since the outbreak of the war in surprising manner. But before all must we be thankful for two qualities of our national character, which perhaps we have not always sufficiently prized—viz., clearness and persistence. On these the authors of this work build, when they cherish the conviction that, spite of closed frontiers and suppression of sea trade, the English starvation plan will founder on the free working together of our millions."

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments have been notified:—Temporary Surgeons: A. McMillan to the *Egmont*; A. E. Iles to the *Victory*, additional, for Haslar Hospital; H. P. Margetts to the *Victory*, additional, for disposal; and W. E. Fox to the *Laurentic*.

ROYAL NAVAL RESERVE.

The undermentioned have been granted temporary Commissions as Surgeons in His Majesty's Fleet: Frederick Harold Rees and Stanley Worthington.

ROYAL NAVAL VOLUNTEER RESERVE.

Surgeon Charles Samuel Brewer to be Honorary Staff Surgeon (dated Feb. 11th).

Staff Surgeon: A. R. Brailey has been appointed to the *Victory*, additional, for Haslar Hospital.

ARMY MEDICAL SERVICE.

Colonel James M. Irwin is retained on the Active List under Article 120, Royal Warrant for Pay and Promotion, and to be supernumerary (dated Feb. 13th).

Major Henry M. W. Gray, Royal Army Medical Corps, Territorial Force, to be temporary Colonel (dated Feb. 1st).

ROYAL ARMY MEDICAL CORPS.

Major John M. Buist is placed temporarily on the Half-pay List on account of ill-health (dated Feb. 6th).

Temporary Captain George E. Miles to be temporary Major (dated Feb. 17th).

Temporary Lieutenant William Anderson, having ceased to serve with the British Red Cross Hospital, Netley, relinquishes his commission (dated Feb. 2nd).

The undermentioned to be temporary Captains:—Dated Jan. 21st: John Curtis Webb. Dated Jan. 23rd: John Joseph Esmonde.

Lieutenant Cecil Corbin relinquishes his temporary commission (dated Feb. 7th).

Lieutenant Charles E. Reckitt relinquishes his temporary commission (dated Feb. 1st).

Mervyn Henry Gordon is granted temporarily the honorary rank of Major (dated Feb. 2nd).

Supernumerary Captain Travis C. Lucas is restored to the establishment (dated Jan. 5th).

Lieutenant Arthur A. Martin relinquishes his temporary commission (dated Feb. 2nd).

Temporary Lieutenant Kenneth William Mackenzie, late Captain, Indian Medical Service, to be temporary Captain (dated Feb. 16th).

Temporary Lieutenant Norman W. Anderson reliquishes his commission (dated Feb. 16th).

The undermentioned to be temporary Lieutenants:—Dated Jan. 21st: Ulick Joseph Bourke and Horace Nathaniel Everard. Dated Jan. 22nd: Bertram Henry Barton and George Flett Barr. Dated Jan. 24th: Peter Hay MacDonald. Dated Jan. 25th: Thomas Henry Brown, John Ellison, Charles Leslie Wigan, John Charles Robb, William Samuel Heron, George McCallum, Roger MacGrath, Cedric Norman Vaisey, and Leslie Alexander Drake. Dated Jan. 26th: Thomas Reginald Trounce, Martin Phillips Thomas, George Michael De Vines, Henry Joseph Cotter, and Thomas Small Goodwin. Dated Jan. 27th: John Stuart Prentice and William John Alexander Bruce Wishart.

SPECIAL RESERVE OF OFFICERS.

Supplementary to Regular Units or Corps: Royal Army Medical Corps.

Lieutenant James F. Quigley resigns his commission.

TERRITORIAL FORCE.

Royal Army Medical Corps.

The undermentioned to be Lieutenants (on probation); Stanley Burrough King and Second Lieutenant Owen Parry-Jones from General Reserve of Officers.

1st East Anglian Field Ambulance: Hugh Frederick Gethin Hall to be Lieutenant.

3rd London General Hospital: Alfred Hope Gosse to be Lieutenant.

4th Scottish General Hospital: William Archibald Campbell to be Captain, whose services will be available on mobilisation.

3rd Southern General Hospital: Frank Gower Gardner to be Lieutenant.

Sanitary Service: Major Alfred Greenwood to be Lieutenant-Colonel (temporary); Major Francis E. Fremantle to be Lieutenant-Colonel (temporary); and George Henry Weston (late Lieutenant, 2nd Volunteer Battalion, Hampshire Regiment), to be Captain, whose services will be available on mobilisation.

1st South Midland Field Ambulance: Major William M. Sturrock to be Lieutenant-Colonel (temporary).

3rd North Midland Field Ambulance: James Ernest Sutcliffe Smith to be Lieutenant.

1st Northern General Hospital: Captain William T. Harkness, from the Northumbrian Casualty Clearing Station, to be Captain.

Eastern Mounted Brigade Field Ambulance: Kenneth Bleckly Clarke to be Lieutenant.

1st East Anglian Field Ambulance: Ambrose Cyril Wilson to be Lieutenant.

2nd Home Counties Field Ambulance: George Mortimer McGilivray to be Lieutenant.

1st East Lancashire Field Ambulance: Gilbert Bailey to be Lieutenant.

1st West Lancashire Field Ambulance: Captain John E. W. McFall to be Major (temporary).

1st Northumbrian Field Ambulance: Home Alexander Playfair Robertson to be Lieutenant.

1st Welsh Field Ambulance: Major John Howard-Jones to be Lieutenant-Colonel (temporary). Captain John O'Sullivan to be Major (temporary).

2nd Welsh Field Ambulance: To be Lieutenants: David Thomas Lewis and Thomas Peters Edwards.

1st Southern General Hospital: Ernest Cordley Bradford to be Lieutenant.

West Lancashire Casualty Clearing Station: Harry Driffield Levick to be Lieutenant.

Attached to Units other than Medical Units.—Lieutenant-Colonel and Honorary Surgeon-Colonel George Hollies resigns his commission on account of ill-health. To be Majors: Major Peverell S. Hichens, from 1st Eastern General Hospital, and Captain James Aitken (temporary). To be Captains: Robert William Meikle (late Captain, Royal Army Medical Corps, Territorial Force) and Charles Stewart Young (late Surgeon-Captain, 3rd Volunteer Battalion, Royal Highlanders). Lieutenant Herbert W. Joyce resigns his commission on account of ill-health. To be Lieutenants: Gerald Francis Carr, Frederick William Arthur Stott, Arthur Henry Fullerton (late Lieutenant, 1st Volunteer Battalion, East Yorkshire Regiment), and Walter Smartt.

ADMINISTRATIVE MEDICAL APPOINTMENTS IN INDIA.—Colonel C. E. Nicol, D.S.O., British Service, has been appointed to officiate as Assistant Director of Medical Services, 5th (Mhow) Division; and Lieutenant-Colonel G. G. Adams, R.A.M.C., has been appointed to officiate as Assistant Director of Medical Services, Jubbulpore and Jhansi Brigades.

Lieutenant-Colonel T. A. Granger, I.M.S., has been appointed Honorary Surgeon to H.E. the Viceroy of India.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In the 96 English and Welsh towns with populations exceeding 50,000 persons at the last census, 8971 births and 6558 deaths were registered during the week ended Saturday, Feb. 13th. The annual rate of mortality in these towns, which had been 18·0, 19·2, and 20·1 per 1000 in the three preceding weeks, fell in the week under notice to 18·9 per 1000 of their aggregate population, estimated at 18,134,239 persons at the middle of 1914. During the first six weeks of the current quarter the mean annual death-rate in these towns averaged 19·1, against 19·9 per 1000 in London. The annual death-rate last week ranged from 8·7 in Wimbledon, 10·9 in Bournemouth and in Smethwick, 11·3 in Bolton, 12·0 in Enfield and in Ilford, and 12·3 in Bury, to 29·1 in Gillingham, 29·2 in Northampton, 29·6 in Carlisle, and 32·5 in Cambridge and in Merthyr Tydfil.

The 6558 deaths from all causes were 437 fewer than the number in the previous week, and included 511 which were referred to the principal epidemic diseases, against numbers rising from 454 to 513 in the four preceding weeks. Of these 511 deaths, 207 resulted from measles, 125 from whooping-cough, 70 from infantile diarrhœal diseases, 66 from diphtheria, 27 from scarlet fever, and 16 from enteric fever, but not one from small-pox. The mean annual death-rate from these diseases was equal to 1·5, against 1·4 and 1·5 per 1000 in the two preceding weeks. The deaths attributed to measles, which had been 206, 191, and 210 in the three preceding weeks, slightly fell to 207 last week, and caused the highest annual death-rates of 1·7 in Tottenham and in Enfield, 1·8 in Stockton-on-Tees, 1·9 in Barnsley, 2·0 in Grimsby, 2·4 in Rotherham, 3·1 in St. Helens, 4·9 in Merthyr Tydfil, 5·2 in Gateshead, and 5·3 in Darlington. The deaths referred to whooping-cough, which had increased from 76 to 123 in the four preceding weeks, further rose to 125 last week; the highest rates from this cause were 1·6 in Bristol, 1·7 in Reading, 1·9 in Willesden and in Dewsbury, 2·0 in Carlisle, and 3·1 in Merthyr Tydfil. The fatal cases of diarrhœa and enteritis (among infants under 2 years of age), which had been 62, 73, and 68 in the three preceding weeks, rose to 70 last week, and included 17 deaths in London, 9 in Liverpool, and 4 each in Stoke-on-Trent and Birmingham. The deaths attributed to diphtheria, which had been 83, 77, and 72 in the three preceding weeks, further declined to 66 last week, of which 16 occurred in London, 6 in Manchester, 5 in Birmingham, and 4 in Sheffield. The deaths referred to scarlet fever, which had been 23, 31, and 22 in the three preceding weeks, rose to 27 last week, and included 13 in London and 2 in Leeds. The fatal cases of enteric fever, which had been 12, 12, and 17 in the three preceding weeks, were 16 last week, of which 4 belonged to London and 2 each to Brighton, Blackburn, and Gateshead.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had steadily declined from 5035 to 3395 in the 11 preceding weeks, had further fallen to 3299 on Saturday last; 368 new cases were admitted during the week, against 308, 326, and 365 in the three preceding weeks. These hospitals also contained 1676 cases of diphtheria, 219 of measles, 58 of enteric fever, 16 of whooping-cough, and 3 of small-pox. The 1696 deaths from all causes in London were 163 below the number in the previous week, and corresponded to an annual death-rate of 19·6 per 1000. The deaths referred to diseases of the respiratory system, which had been 417, 450, and 497 in the three preceding weeks, declined to 455 in the week under notice, but were 193 in excess of the number recorded in the corresponding week of last year.

Of the 6558 deaths from all causes in the 96 towns 175 resulted from different forms of violence and 456 were the subject of coroners' inquests, while 1805 occurred in public institutions. The causes of 45, or 0·7 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Sheffield, Leeds, Bristol, West Ham, Bradford, Hull, and in 70 other smaller towns. Of the 45 uncertified causes of death 9 were registered in Liverpool, 8 in Birmingham, 4 in Gateshead, 3 each in London and Preston, and 2 each in Stoke-on-Trent, Blackpool, and Carlisle.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,345,500 persons at the middle of this year, 1132 births and 1037 deaths were registered during the week ended Saturday, Feb. 13th. The annual rate of mortality in these towns, which had been 21·7, 22·4, and 24·1 per 1000 in the three preceding weeks, declined to 23·1 per 1000 in the week under notice. During the first six weeks of the current quarter the mean annual death-rate in these towns averaged 23·1, against 19·1 per 1000 in the large English towns. Among the several towns the death-rate last week ranged from 13·5 in Hamilton, 15·1 in Motherwell, and 15·0 in Paisley, to 28·9 in Falkirk, 36·8 in Perth, and 37·4 in Dundee.

The 1037 deaths from all causes were 49 fewer than the number recorded in the previous week, and included 122 which were referred to the principal epidemic diseases, against numbers rising from 92 to 147 in the four preceding weeks. Of these 122 deaths, 81 resulted from whooping-cough, 14 from infantile diarrhœal diseases, 11 from measles, 8 from scarlet fever, 6 from diphtheria, and 2 from enteric fever, but not one from small-pox. The mean annual death-rate from these diseases was equal to 2·7, against 1·5 per 1000 in the large English towns. The deaths attributed to whooping-cough, which had steadily increased from 28 to 86 in the seven preceding weeks, fell to 81 last week, of which 42 occurred in Glasgow, 20 in Dundee, 5 in Greenock, and 4 in Edinburgh. The deaths of infants (under 2 years) referred to diarrhœa and enteritis, which had increased from 7 to 16 in the four preceding weeks, fell to 14 last week, and included 5 deaths in Glasgow, and 2 each in Dundee, Leith, and Clydebank. The fatal cases of measles, which had been 7, 6, and 13 in the three preceding weeks, fell to 11 last week, of which 9 were registered in Dundee. The deaths attributed to scarlet fever, which had been 16, 12, and 17 in the three preceding weeks, declined to 8 last week, and included 4 in Glasgow and 2 in Falkirk. The deaths referred to diphtheria, which had been 8, 10, and 13 in the three preceding weeks, fell to 6 last week, of which 2 were recorded in Glasgow. The 2 fatal cases of enteric fever belonged to Glasgow and Coatbridge respectively.

The deaths referred to diseases of the respiratory system, which had been 238, 272, and 302 in the three preceding weeks, fell to 278 in the week under notice, but were 131 in excess of the number recorded in the corresponding week of last year; 35 deaths resulted from different forms of violence, against 30 and 36 in the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the 27 town districts of Ireland with an aggregate population estimated at 1,212,330 persons at the middle of this year, 680 births and 615 deaths were registered during the week ended Saturday, Feb. 13th. The annual rate of mortality in these towns, which had been 24·0, 24·7, and 26·2 per 1000 in the three preceding weeks, further rose to 26·5 per 1000 in the week under notice. During the first six weeks of the current quarter the mean annual death-rate in these towns averaged 25·5, against corresponding rates of 19·1 and 23·1 per 1000 in the English and Scotch towns respectively. The annual death-rate last week was equal to 28·0 in Dublin (against 19·9 in London and 21·6 in Glasgow), 24·6 in Belfast, 39·4 in Cork, 27·8 in Londonderry, 23·0 in Limerick, and 13·3 in Waterford, while in the 21 smaller towns the mean death-rate was 24·3 per 1000.

The 615 deaths from all causes were 6 in excess of the number recorded in the previous week, and included 44 which were referred to the principal epidemic diseases, against 32 and 38 in the two preceding weeks. Of these 44 deaths, 17 resulted from whooping-cough, 13 from infantile diarrhœal diseases, 5 from measles, 4 each from scarlet fever and diphtheria, and 1 from enteric fever, but not one from small-pox. The mean annual death-rate from these diseases was equal to 1·9, against 1·5 and 2·7 per 1000 in the English and Scotch towns respectively. The deaths attributed to whooping-cough, which had been 9, 11, and 13 in the three preceding weeks, further rose to 17 last week, of which 10 were recorded in Dublin and 3 in Cork. The deaths of infants (under 2 years) referred to diarrhœa and enteritis, which had been 4, 8, and 10 in the three preceding weeks, further rose to 13 last week, and included 8 in Dublin and 2 in Belfast. The 5 fatal cases of measles, of which 3 occurred in Belfast, were 3 in excess of the average in the earlier weeks of the year. Of the 4 deaths attributed to scarlet fever 3 occurred in Belfast. Two of the 4 deaths from diphtheria and the fatal case of enteric fever were registered in Dublin. In addition to the above deaths, a fatal case of typhus occurred in Galway.

The deaths referred to diseases of the respiratory system, which had been 137, 160, and 172 in the three preceding weeks, further rose to 182 in the week under notice. Of the 615 deaths from all causes, 175, or 28 per cent., occurred in public institutions, and 6 resulted from different forms of violence. The causes of 25, or 4·1 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest; in the English towns the proportion of uncertified causes did not exceed 0·7 per cent.

Correspondence.

"Audi alteram partem."

MILD SMALL-POX.

To the Editor of THE LANCET.

SIR,—In connexion with an annotation in THE LANCET of Feb. 13th, may I add a word on the subject, as I was unavoidably absent from the meeting of the Section of Epidemiology of the Royal Society of Medicine at which Dr. J. B. Cleland and Dr. E. W. Ferguson reported on the outbreaks of small-pox in Australia?

Studying the disease during successive years, I came to the conclusion that it was not safe to make any statement about it without consulting Sydenham, and students of these present mild outbreaks would have done well, as Dr. McPhail reminded them in the discussion, to look up the history of prevaccination outbreaks. The extraordinary difference in their virulence was not only recognised by Sydenham, but by Van Swieten, Mason Good, Jenner, and others. Mason Good mentions that in his own case (1770) he had not more than 20 scattered pustules, and Jenner describes an epidemic as mild and light as the inoculated variety. All the same, it is not a pleasant experience, as happened in my wards, to have an outbreak arise and not reach a diagnosis until the seventh or eighth case proves to be one of confluent small-pox! One unvaccinated child had not more than half a dozen superficial pustules, and Welch and Schamberg report an instance with a single pox. Apart from the low virulence, an interesting feature of many of the recent American outbreaks has been the high percentage of unvaccinated attacked—96 out of 97 cases in the outbreak at Carbondale, Pennsylvania (1912).

With this history one cannot agree with the conclusion of Dr. Cleland and Dr. Ferguson that in Australia or elsewhere small-pox is unlikely to recover again its general intense virulence.

I am, Sir, yours faithfully,

Oxford, Feb. 13th, 1915. WILLIAM OSLER.

FROST-BITE.

To the Editor of THE LANCET.

SIR,—The paper by Mr. A. W. Mayo-Robson on Frost-bite, which appears in THE LANCET of Jan. 16th, is timely. The subject is certainly one of the most interesting, and is among the most novel of those which have come under our consideration since the beginning of this war. The severity of the cases which we have had in Rouen has varied within the widest limits. There are cases in which no appreciable changes have taken place in the appearance of the limbs, yet the whole of the skin, especially that on the inner side of the foot and on the dorsum of the toes, is acutely hypersensitive even to the lightest touch. There are, at the other extreme, cases in which to all appearance the whole foot is doomed to gangrene.

I am not, however, at this moment so much concerned with the various grades of injury, with the means by which the condition is produced, nor with the absolute necessity in all cases of conservative treatment. I wish more particularly to give a hint with regard to the care of these patients. A great variety of methods of local treatment have been tried: turpentine and lanoline applications; thorough cleansing and drying, followed by the swathing of the foot in boracic acid powder and wool; painting with tincture of iodine; and so forth. I really think that, apart from the pain inflicted, there is no appreciable difference in the results of these or other methods. At one time all cases were treated by local applications, over which was a covering of wool with a bandage. It is usual to hear the statement made that great pain is suffered by many, indeed by almost all, of the patients. The pain at times may be so severe as to call for morphine or opium for its relief. The pain, however, is due, not so much to the damage inflicted upon the parts, but to the fact that the feet are kept warm.

During the last few weeks here the majority of the patients have had little or no dressing applied. The parts affected are smeared with some ointment, covered with a thin layer of gauze, and left without wool or bandage. The feet are often raised a few inches from the bed upon a hard pillow. The lower part of the legs and the feet are covered in bed only by a sheet. It has been our experience with few exceptions to find that the pain is very considerably lessened or abolished by keeping the parts cold. A patient whose feet have been well wrapped up and bandaged and who has suffered nights of torture will experience relief in a few hours when the bandages are removed and the bedclothes are turned back.

Pain, it may truthfully be said, is almost exactly proportioned to the degree of warmth of the foot. Seeing that, whatever the local treatment, the progress towards recovery in the foot appears to be equally rapid, it is the relief of pain during the time of healing that should be our chief consideration.

I am, Sir, yours faithfully,

Feb. 13th, 1915. BERKELEY MOYNIHAN,

THE POSITION OF THE FRENCH RED CROSS IN ENGLAND.

To the Editor of THE LANCET.

SIR,—The attention of our committee has been called to an appeal in your issue of Feb. 6th, p. 303, on behalf of the Wounded Allies Relief Committee for £100,000 for the purpose of establishing or maintaining certain Anglo-French hospitals in France. The admirable work done by THE LANCET since the war began in aid of the wounded of all nationalities makes one hesitate to offer anything that may even savour of criticism. At the same time, in the best interests of at any rate the French wounded, it seems well to call attention to certain facts.

There is no doubt that in some of the distant fields of strife—Serbia, for instance—there is ample scope for new societies and fresh individual effort. In the case of the French, however, these considerations do not apply, and the advocacy of new societies established through the enthusiasm of doubtless sincerely well-meaning people can result only in loss of coördination, overlapping, and not infrequently inevitable friction with thoroughly established and fully recognised organisations. France has had for many years three excellent organisations for rendering assistance to the injured in any public calamity. These are: La Société Française de Secours aux Blessés, l'Union des Femmes de France, and l'Association des Dames Françaises. As regards the organisation of help from this country, the French Government,

acting through the Ambassador, has officially appointed the London Committee of the French Red Cross, under the presidency of the Vicomtesse de la Panouse, to represent these three societies, which have in their charge practically the whole of the voluntary care of the wounded French. It provides surgeons, nurses, orderlies, and stores of all kinds for the French voluntary hospitals. It assists in a great many similar ways the British hospital units which have been established by private generosity in France. Most of these, unless actually under the control of the British Red Cross Society, have found it to their advantage to become affiliated to the above London Committee of these three great French societies and to work through it.

This committee has also elaborated a system whereby British surgeons who are good enough to volunteer their services for a month or more can be found suitable posts. Further, the London Committee of the French Red Cross being in intimate official relations with the French Government will be able to make the best arrangements for hospitals and new centres when the movement of the armies we all hope for takes place. It is therefore evident that as far as the French wounded are concerned there is absolutely no need for further societies, and it is certainly inadvisable to distribute subscriptions amongst new organisations for hospitals which may or may not continue, or be allowed to continue, to exist. Such a course, in addition to the inconveniences already mentioned, can only lead to waste of time, energy, and money.

I therefore venture to appeal to intending subscribers wishful to help in the most certain and efficient manner the wounded of the French armies, who have so gallantly held more than 250 miles of the Western battle line, to concentrate their efforts and contributions in favour of the London Committee of the French Red Cross (of which the honorary secretary is Mr. P. A. Wilkins, 25, Knightsbridge, London, S.W.), which is in a position to send the help to the points where it is most needed.

I am, Sir, yours faithfully,

JAMES DONELAN,
Medical Referee to the Committee.

Manchester-square, W., Feb. 15th, 1915.

THE ETIOLOGY OF POLIOMYELITIS.

To the Editor of THE LANCET.

SIR,—Dr. J. T. C. Nash in THE LANCET of Jan. 16th asks for further information regarding the cases of poliomyelitis at West Kirby. In the first place, he wishes to know the distance of each infected house from the nearest stable. I am sorry I am not in a position now to give the exact distance, but in no case, I believe, was a stable situated near, or what one usually considers near. With regard to the second point, I understand the same horse and cart took round the milk, so that there is nothing here incompatible with Dr. Nash's theory that stomoxys calcitrans may be carried considerable distances, following or resting on a horse. When investigating the cases, however, I was more impressed by the possibilities and probabilities of human carriers being concerned, and even that one of the distributors of milk was the likely source of infection.

The first case in the last outbreak at West Kirby was the son of a medical man who had attended cases of the previous year. It is interesting to recall that when the late Dr. R. Burnet, of Cornwall, was investigating the outbreak of poliomyelitis in that county four years ago his only son fell a victim to the disease, probably being infected by his father. There is, I think, a growing body of evidence in favour of the theory of poliomyelitis being spread by the agency of human carriers.

I am, Sir, yours faithfully,

Hartlepool, Feb. 15th, 1915. GEORGE JUBB, M.D., D.P.H.

FAITH AND ASTIGMATISM.

To the Editor of THE LANCET.

SIR,—If it should ever be my misfortune to be tried for my life at the Old Bailey or elsewhere I shall not attempt to obtain the services of Mr. Reginald Evershed as my advocate, for if I did there can be little doubt my state of suspense would very soon end in one of suspension.

Mr. Evershed, in THE LANCET of Feb. 6th, is particularly unfortunate in the case he quotes to support the views of the refraction extremists. Which idea does he hold: that the discovery of the extra 1/4 diopter of astigmatism in the one eye cured the patient? or the mysticism of Prey's letters, &c., and the probable reassurance given him that the glasses would do so? Is not Mr. Evershed between two horns of a dilemma? A dignified silence is a useful thing to maintain when you cannot maintain anything else, and the attitude shown by the two original contributors to the subject may well be commended to Mr. Evershed, at least until he is on surer ground.

Now, Sir, I did not write my first letter with a view to depreciating the shares of the Langham Hotel or of the railways converging upon Harrogate. Far from it. My intention was to disclaim—for myself at any rate—the extreme views held by some members of my specialty in this country which tend to bring the holders and the specialty into ridicule at the hands of the more moderate members of the profession who, fortunately, are in a great majority. Extremists are deficient in the sense of proportion, and specialists are apt to suffer from the same disorder, especially if they specialise too early. My own opinion is that no one should take up any specialty until he or she has had ten years' experience of general practice. Such a practitioner gets out of the way of looking at things and people through the same pair of spectacles. Refraction extremists are by no means confined to this country, and across the herring pond is one of their archpriests, who is so extreme that I quite look forward to his asserting some day that St. Paul's thorn in the flesh was really a refraction error, and that if only the German Emperor had paid a visit to his "office" this horrible war would certainly have been prevented. And though prevention is better than cure, yet since it is claimed by some that a tendency to insanity can be cured by suitable correcting lenses, would it not be well to appoint one of these gentlemen ophthalmic surgeon to Bedlam? Who knows how many of the unfortunate inmates thereof might be cured or relieved by a pair of spectacles? *Quis dubitat?*

We see extremes and extremists everywhere——e.g., in politics the advanced Radical thinks nothing good can come from the opposite party and *vice versâ;* in the Church, the extreme High Church cleric, who plays croquet on Sunday afternoon, would shrink from burying a Dissenter in his churchyard, whilst another would be only too pleased to bury the whole of them there; or the eugenist crank who insists upon our marrying Mary when we feel we can only be happy with

Jane in spite of the small strawberry mark on her arm; and so on, and so on. Extremists, of course, have their place in the sun and do some good. They tend to develop the antibodies of moderation and make us challenge and prove all things, holding fast to that which is true, which, in the long run, is invariably found to be moderate. But, Sir, even in the length of one's epistles to the Editor of THE LANCET one must study the science and practise the art of moderation, and to escape the opposite soft impeachment I will at once subscribe myself

Yours faithfully,

Norwich, Feb. 13th, 1915. S. JOHNSON TAYLOR.

THE SUPPLY OF LOCUM TENENTS.

To the Editor of THE LANCET.

SIR,—May I trespass on your space for a few remarks on this very vital question? When war broke out necessarily a large number of medical men who belonged to the Royal Army Medical Corps were immediately obliged to take up their duties, and many others have in ever-increasing numbers since loyally and patriotically in obedience to their country's call voluntarily thrown up lucrative practices and applied for commissions, and by no means a small number have enlisted in the fighting ranks.

Necessarily, therefore, a largely increased demand has arisen for locum tenents to safeguard the practices at home of those who have nobly offered their services and lives for England's honour. Owing to many of those who had hitherto been available as locum tenents also responding to the call it has become increasingly difficult to find enough reliable substitutes, and I regret to have to say that there is a tendency on the part of a few to take advantage of the shortage to demand fees quite incompatible with the services rendered. May I through your columns implore all who are in any way able to take up duty again to offer their services in the present crisis?

I am glad to say that many retired practitioners up to 70 years of age have loyally come forward and most satisfactorily filled some of the gaps, and some of our Belgian Allies who can speak English a little have been of great assistance for temporary work, but more are urgently needed if we are to ensure that the practices of those who have so nobly rallied round the flag shall not suffer. There is plenty of work for every available qualified man, especially if prepared to show his patriotism and loyalty to his profession by accepting fees in some measure proportionate to the size of the practice he is taking charge of.

I am, Sir, yours faithfully,

Adam-street, Adelphi, Feb. 8th, 1915. PERCIVAL TURNER.

SULPHUR AND RHEUMATISM.

To the Editor of THE LANCET.

SIR,—In reference to what Sir Lauder Brunton says about sulphur and rheumatism in your issue of Feb. 6th, I think the following case is to the point. A patient, aged 55 years, had suffered from joint pains, called rheumatism, since he was 19 fairly continuously, and no treatment did him any good. It happened that he took sulphur for the relief of an attack of lumbago and continued it for some four months as a prophylactic. His rheumatism was completely cured and has remained so for some six years, during which he has continued to take two or three troch. sulph. two days a week. The essence of the treatment as a cure is that it should go on some months before the cure is likely to obtain.

I am, Sir, yours faithfully,

Harley-street, W., Feb. 13th, 1915. SHEFFIELD NEAVE.

THE SHORTAGE OF RESIDENT MEDICAL OFFICERS.

To the Editor of THE LANCET.

SIR,—Dr. R. R. Rentoul's letter in your last issue, which somewhat severely comments on mine of Feb. 6th, has been the means of my discovering that in my letter the word "*voluntary*" is inserted before the word "residence," thereby giving the impression that we wished to get the doctors' services for nothing. Such is far from the case; we are quite ready to pay such doctors even more than the "lost dog's wage," which Dr. Rentoul mentioned as the ordinary rate of pay. If we cannot pay the princely salaries that Dr. Rentoul states obtain in Government services, it is our misfortune and not our fault. At the present time the difficulty we are experiencing is being felt by almost every hospital in London. To use a colloquialism, residents are hardly to be obtained for love or money.

I am, Sir, yours faithfully,

W. M. WILCOX,
Secretary.

East London Hospital for Children, Shadwell, E., Feb. 16th, 1915.

*** We regret the mistake. Voluntary help is being accorded to some hospitals in a similar dilemma, we understand, and medical men who are able to assist charitable work in this way are discharging a most valuable duty.—ED. L.

TYPHOID AND PARATYPHOID INFECTION IN RELATION TO ANTITYPHOID INOCULATION.

To the Editor of THE LANCET.

SIR,—Owing to an error in the delivery of the "proof" of the paper which you so kindly published for us last week at very short notice, two small errors remained uncorrected. On p. 325, col. 1, the second line from the bottom should read: "In *non*-inoculated persons," &c. As it stands the statement is obviously nonsense. On the same page, col. 2, line 35 (about the middle of the page), the figure 700 should be 900, as can be seen from the chart on the following page.

We are, Sir, yours faithfully,

GEORGES DREYER,
E. W. AINLEY WALKER,
ALEX. G. GIBSON.

Department of Pathology, University of Oxford, Feb. 16th, 1915.

"WOOLNER'S TIP" AND FAMILY RESEMBLANCES.

To the Editor of THE LANCET.

SIR,—Apropos of the informing annotation on this subject in THE LANCET of Feb. 13th it may interest your readers to know that Thomas Woolner was probably careful to reproduce the "tip," named after him, in his well-known bust of Darwin now at Cambridge. At least, one may infer that he did so, as it may be felt, when searched for *ad unguem*, to use the old Roman sculptors' phrase, in the left ear of the plaster replica of this bust recently

placed between Huxley and Owen in the museum vestibule of the Royal College of Surgeons of England. The plaster bust, presented to the College by Sir Lauder Brunton, Bart., was executed in or after 1869, in which year Woolner sculptured the likeness of Darwin's head. It is not a very good likeness of the great naturalist, a better having probably been caught by Sir Lauder Brunton himself, whose model in clay after the engraving by Jeens in *Nature*, elicited the remark from Darwin, "Well! one never knows what one is like." The pose of this was absolutely correct: Woolner's was not, though Woolner has reproduced the Cro-Magnan brows of the great authority on earliest man. Darwin refers to the "celebrated sculptor, Mr. Woolner," in an early chapter of the "Descent of Man," which was published in 1871. Woolner became aware of the "little blunt point projecting from the inwardly folded margin or helix" when engaged on a bust of Puck. He sent a drawing showing the "tip" to Darwin, which the latter has reproduced in his text. In Woolner's marble bust of Sir John Simon, K.C.B., also at the College, the tip is plainly distinguishable, but it does not reappear in the plaster cast of the same. The older sculptors, such as Chantrey, executed the ear conventionally, if, indeed, they did not hide it under a fringe of hair. This appears on examination.

It is a question how far a sculptor should be a minute anatomist. The Greeks, as Professor Mahaffy points out, were eclectic, and sculptured "combination" limbs or organs, choosing the most shapely points from many models and thus combining an idealised type. This appears in their reproductions of the genital organs of man. M. Rodin, on the other hand, was so intent on reproducing the exact proportions and outlines of limbs, muscles, veins, &c., that he made of his Saint John a sort of squat anatomical model, suggestive of a man divested of underclothing. The statue when sent in competition to the Académie des Beaux Arts was rejected by the judges on the ground that it was a cast from nature—at least, so the legend runs.

With regard to family likenesses, I may mention that an ancestral type sometimes reappears in a surprising manner. The late Paul Fordyce Maitland, a landscape painter familiar some years ago to habitués of Kensington Gardens, might have been Maitland of Lethington returned to life, so strikingly did his fine face resemble that of his ancestor. The same may be said of a living descendant now in London of Mallet du Pan and of Juan Bonaparte. And I trust I am not guilty of impertinence when I say that Miss Hunter Baillie, when standing in front of G. Home's portrait of her illustrious collateral ancestor John Hunter, wearing a brown coat, appeared to interested observers as if she had stepped out of the frame.

Others besides myself may have observed that for one moment just after death a face seems sometimes to change back to the exact resemblance of some familiar family portrait or miniature.

I am, Sir, yours faithfully,

Feb. 15th, 1915. P. V.

ON Feb. 15th, at Bow-street police-court, Mr. Hopkins committed for trial at the Central Criminal Court Arthur Alfred Henry Bennett, described as a surgeon of no fixed abode, on the charge of committing perjury in the High Court of Justice in July last during the hearing of the action for libel unsuccessfully brought by Mr. C. H. Stevens against the British Medical Association.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE CENTRAL EXECUTIVE COMMITTEE.

A MEETING of the Central Executive Committee was held on Feb. 11th at the office of the British Medical Association, when Mr. J. Y. W. MacAlister, librarian and secretary of the Royal Society of Medicine, joined the meeting as a coöpted member of the committee. Correspondence between the chairman, Sir Rickman Godlee, and the President of the General Medical Council was read, showing the difficulty that there would be in securing any remission of, or reduction in the registration fees payable by Belgian graduates now admitted to the British Register under certain conditions. The committee therefore decided to act in accordance with the course of conduct previously decided upon, and the registration fees will be advanced by the Fund in cases where such action appears necessary and suitable, and where the Belgian graduates have received offers of employment.

Dr. Des Vœux took the occasion of the first meeting held since the money which had passed through the treasurer's hands exceeded £5000 to make a short financial statement. He said that £5297 had been received by him and acknowledged in THE LANCET, the *British Medical Journal*, and the pharmaceutical journals. More money than this had been subscribed, as certain local funds remained in the hands of the local treasurers, as did the Scottish and Irish Funds. Mentioning the principal subscriptions in detail, he said that so far money had only been received from 1500 people, allowing for the fact that certain large subscriptions had been sent to him with no epitomised details. He had placed £4000 on deposit at the bank, and showed that a sum of about £470 had been spent already, or was arranged to be immediately spent upon pecuniary relief in urgent cases, upon purchase of clothes, upon advances for registration fees, and upon boxes of medical material shipped to Brussels through the Commission for Relief in Belgium. The committee decided to carry on their work for the present upon the same lines, on the one hand helping immediately in necessary cases, and on the other husbanding the money as much as possible, after the relief of urgent distress, so that it may be available as the nucleus of a future international subscription for the rehabilitation of the medical profession in Belgium.

The committee, through the eleemosynary subcommittee, has made grants to certain urgent cases, either for the purchase of necessities like food and clothes, or to facilitate the taking up of paid appointments. The registration fees have also been paid of Belgian medical men who are joining the British Register preparatory to accepting salaried posts.

THE AMERICAN COMMITTEE FOR THE AID OF BELGIAN PHYSICIANS.

The treasurer of the committee of American physicians constituted for the aid of the Belgian medical profession has made a report of all contributions received up to and including Jan. 16th, 1915. A total of $1.414 had been received by that date, including subscriptions of $100 from Dr. Franklin H. Martin, Chicago; Dr. F. F. Simpson, Pittsburg; Mrs. John B. Murphy, Chicago; Dr. Abraham Jacobi, New York; and the Academy of Medicine, Cincinnati. The expenditure so far includes the

payment for 450 boxes of food purchased from Austin, Nichols and Co. at $2.20 per box. Dr. F. F. Simpson, Jenkins Arcade Building, Pittsburgh Pennsylvania, is acting as treasurer to the committee, and has issued a circular stating that all contributions will immediately be converted into supplies and that these will be transmitted to Belgium and distributed among the Belgian doctors. The circular issued by Dr. Simpson and Dr. Howard C. Taylor, the secretary of the committee, says: "Every cent of every dollar contributed will be available for the purchase of supplies as the carrying charges are provided for by the American Commission for Relief in Belgium. The first one thousand dollars contributed have been expended by the Executive Committee for food and supplies, and the packages properly labeled have been started for their destination."

The personnel of the committee as now constituted is as follows: Victor C. Vaughan, President, American Medical Association; William L. Rodman (Vice-chairman), President-elect, American Medical Association; John B. Murphy, President, Clinical Congress of Surgeons of North America; Charles H. Mayo, President-elect, Clinical Congress of Surgeons of North America; J. M. T. Finney, President, American College of Surgeons; J. Riddle Goffe, President, Seventh International Congress for Obstetrics and Gynæcology; Stuart McGuire, President, Southern Medical Association; Samuel J. Meltzer, President, Association of American Physicians; Hugh Cabot, President, Mississippi Valley Medical Association; William C. Woodward, President, American Public Health Association; Theodore C. Janeway, Johns Hopkins Medical School, Baltimore; Frank Billings, Chicago; George H. Simmons, Editor, *Journal of the American Medical Association;* Franklin H. Martin (Chairman), Editor, *Surgery, Gynæcology, and Obstetrics;* Thomas L. Stedman, Editor, the *Medical Record;* E. W. Taylor, Editor, the *Boston Medical and Surgical Journal;* Claude L. Wheeler, Editor, the *New York Medical Journal;* Howard Canning Taylor (Secretary), New York; and Frank F. Simpson (Treasurer), Pittsburgh, Pennsylvania.

THE WEEK'S SUBSCRIPTIONS.

The subscriptions received by Dr. Des Vœux up to Tuesday evening last, in addition to those previously acknowledged, and not including money collected by certain local funds, and the Scottish and Irish Funds, are as follows:—

	£	s.	d.
Dr. Sheila M. Ross ...	1	1	0
Mr. G. Grahame, H.M. Consul-General	1	1	0
Dr. Edgar F. Cyriax ...	3	3	0
Tower Hamlets Division, B.M.A. (per Dr. W. H. F. Oxley (Hon. Sec.). first list—			
Dr. Rowe Hall	2	2	0
Dr. G. R. Young ...	2	0	0
Dr. D. Spillane ...	1	1	0
Dr. A. Harvey	1	1	0
Dr. J. A. Milne ...	1	1	0
Dr. D. Hume	1	1	0
Dr. T. J. S. Suffield.	1	1	0
Dr. J. Paxton	1	1	0
Dr. C. K. Toland ...	1	1	0
Dr. B. Byrne	1	1	0
Dr. H. Richardson ...	1	1	0
Dr. F. Spurr	1	1	0
Dr. Butler Hogan ...	1	1	0
Dr. J. H. Arthur ...	1	1	0
Dr. E. A. Campbell...	1	1	0
Dr. W. H. F. Oxley	1	4	6
Dr. L. Turiansky ...	0	10	6
Dr. B. I. Rahim ...	0	5	0
Dr. G. Hessenauer...	0	5	0
Dr. Frank Stevenson ...	2	2	0
Mr. W. Bray	0	5	0
Dr. A. Bowe	1	1	0
Brussels Medical Graduates' Association (per Dr. Major Greenwood, Treas.), further donation	6	6	0
Miss C. M. Lace	1	1	0
Jersey Medical Society (per Mr. E. O. B. Voisin, Treas.)	5	5	0
Medical Committee, Royal Free Hospital, Gray's Inn-road (per Hon. Sec.)	3	15	0
Dr. Edward Scott	2	2	0
Dr. T. E. Walker	1	1	0
Nurses' General Hospital, Rangoon...	100	0	0
Staff. Branch, South Staff. Division, B.M.A. (per Dr. H. C. Mactier, Hon. Sec.), second list—			
Dr. J. A. Lycett ...	1	1	0
Dr. Lila Gregg... ...	1	1	0
Mr. A. H. W. Hunt	1	1	0
Dr. E. Weatherhead	0	10	0
Dr. W. S. Badger ...	0	10	6
Messrs. William Ransom and Son, Ltd.	5	5	0
Stourbridge Medical Society (per Dr. G. J. Dudley, Hon. Sec.) ...	2	2	0
Mr. T. J. Webster	2	2	0
Lt.-Col. R. Davis, I.M.S.	1	0	0
Lt.-Col. F. Marsh, R.A.M.C. (T.)	5	5	0
Mr. A. Ll. Vaughan ...	2	2	0
Sir Felix Semon, K.C.V.O.	2	2	0
Dr. H. N. Keeling... ...	1	0	0
Dr. J. R. Preston	1	1	0
Dr. Mabyn Read	2	2	0
Mr. V. S. Hodson	1	1	0
Woolwich Division, B. M. A. (per Dr. B. W. Lacey, Hon. Sec.)—			
Dr. A. S. St. John ...	1	1	0
Oldham Medical Society (per Dr. F. F. Pochin, Hon. Sec.), second list—			
Dr. A. Wharton ...	2	2	0
Dr. Wilson	2	2	0
Dr. Clegg	1	11	6
Dr. Low	1	11	6
Dr. Ferguson	1	1	0
Dr. Lendrum	1	1	0
Dr. Wilkinson (second donation)	0	10	6
Birmingham Local Committee (per Dr. Robert Saundby, Hon. Sec.), seventh donation—			
Mr. J. Furneaux Jordan (from Members' Fund, Birmingham Branch, B. M. A.)	10	10	0
Dr. and Mrs. A. R. Forrest-Hay (proceeds of Whist Party)	9	5	0
Dr. A. Vaughan Bernays	2	2	0
Mr. T. H. Smith ...	1	1	0
Dr. A. Douglas Heath	2	2	0
Dr. E. L. Bunting (per Dr. C. Pollard)	1	1	0
Dr. S. W. Haynes ...	1	0	0
Middlesex Division, Tottenham Ward, B.M.A. (per Dr. G. R. Plaister, Hon. Sec.)—			
Dr. R. B. Marjoribanks	1	1	0
Dr. C. Gurney Thompson	0	10	6
Dr. L. P. Scott ...	0	10	6
Dr. J. L. Sykes ...	0	10	6
Dr. Kingdon	0	10	6
Dr. A. V. Craig ...	0	10	6
Dr. I. F. Broughton.	0	10	6
Dr. W. H. Plaister...	0	10	6
Dr. G. R. Plaister ...	0	10	6
Dr. Wm. Hern	2	2	0
Mr. T. W. Townley ...	0	10	6
Mr. G. Weston	0	10	6
Messrs. M. H. Stiles and Son	0	10	6
Mr. E. J. Millard	2	2	0
Mr. E. H. Farr	2	2	0
Mr. L. Cooper...	1	1	0
Mr. H. O. Thomas... ...	0	10	6
Norwich and District Pharmacists' Association (per Mr. P. Robinson), first list—			
Mr. G. C. Maynard	1	1	0
Mr. H. J. Heyhoe ...	1	1	0
Mr. J. Staton	1	1	0
Mr. P. Robinson ...	1	1	0
Mr. W. H. Hurn ...	1	1	0
Mr. Houlton	1	1	0
Mr. T. N. Eastland	1	0	0
Mr. F. G. H. Plumstead	0	10	6
Mr. F. Smith	0	10	6
Mr F. T. Alpe... ...	0	5	0
Mr. Robinson (Dereham)	0	5	0
Mr. A. E Beeston ...	1	1	0
Mr. F. S. Cullen ...	2	2	0
Mr. H. E. DeCarle ..	1	1	0
Mr. C. H. Hipperson	0	10	6
Mr. W. J. Lacey ...	1	1	0
Mr. W. H. Lenton...	1	1	0
Mr. H. G. Maddison.	0	5	0
Mr. J. M. Weller ...	1	0	0
Messrs. Smith and Sons	1	1	0
Western Pharmacists' Association (per Mr. H. R. Procter)	120	0	0
Thames Valley Pharmacists' Association (per Mr. A. Higgs)	11	11	0
Mr. G. H. Toy (per Mr. F. Smith, Hon. Sec. Birmingham Pharmaceutical Association)...	0	10	0
Mr. A. Pellew	1	1	0

The Western Pharmacists' Association head the list with the handsome donation of £120, and £100 have been received from the Nurses' General Hospital, Rangoon.

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham-gate, London, S.W., and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund and crossed Lloyds Bank, Limited. These will be acknowledged by post direct, and a list will appear in THE LANCET weekly.

A WATER SCARE IN LONDON.—Water consumers in the west-end district of London were somewhat alarmed early in the week to find that their service-supply was offensive both to the taste and smell. We understand that an official assurance has been issued to the effect that the unpleasant condition of the water was due to harmless algæ—water organisms of no pathogenic significance whatever. Two years ago the same thing happened in the Hampstead district without any harm accruing. The alarm was intensified in the recent instance by a suggestion that possibly the reservoirs had been tampered with by our enemies. We wonder whether this departure from the normal condition of our water-supply was possibly connected with the flooding of the Thames a month or so ago. We then remarked that "it will be interesting to watch the future official reports upon the purity of the supply based upon the examination of samples synchronising with the flooding period." Consumers are perfectly justified in refusing to use an offensive water until the circumstances are cleared up, but in the meantime they would be safeguarded by adopting the simple precaution of boiling the water, when its disagreeableness would disappear and all questions of its possible pathogenicity dispersed.

The War.

MENTIONED IN DESPATCHES.

The following officers connected with the medical profession and occupying the indicated positions with our army are recommended in Sir John French's despatch, dated Jan. 14th and issued from the War Office this week, "for gallant and distinguished service in the field." Alas, several of them are no longer with us.

General Headquarters and Staff, &c.

Brunskill, Maj. J. H.
Ensor, Maj. H., D.S.O.
Ferguson, Lt.-Col. N. C., C.M.G.
Geddes, Col. R. J., D.S.O.
Irvine, Maj. F. S.
Martin, Maj. J. F.
Meeks, Col. J.
Morgan, Maj. C. K.
O'Keefe, Col. M. W.
Porter, Surg.-Gen. (temp.) R.
Sawyer, Col. R. H. S.
Swan, Col. W. T.
Treherne, Col. F. H.
Sloggett, Surg.-Gen. Sir A. T., C.B., C.M.G.
Holt, Brevet-Col. M. P. C., D.S.O.
Moores, Lt.-Col. S. G.

Medical Services.

Barbour, Maj. J. H.
Bateman, Maj. H. R.
Beatty, Maj. M. C.
Bewley, Lt.-Col. A. W.
Black, Maj. R. B., Res. of Off.
Bowlby, Col. (temp.) Sir A. A., Kt., C.M.G.
Bradford, Col. (temp.), Sir J. R., K.C.M.G., F.R.S.
Brazier-Creagh, Lt.-Col. G. W., C.M.G.
Burtchaell, Lt.-Col. (temp. Col.) C. H.
Campbell, Capt. J. H.
Chalk, Qrmr. and Hon. Maj. A. J.
Dennis, Maj. B. R.
Dwyer, Capt. P.
Ellis, Maj. W. F.
Evans, Maj. C. R.
Evans, Maj. P.
Fell, Maj. M. H. G.
Glasse, Lt. (temp.) J. M.
Goodbody, Maj. C. M., I.M.S.
Hardy, Lt.-Col. F. W.
Harrison, Maj. L. W.
Huntingford, Qrmr. and Hon. Lt. A.
Jones, Col. F. W. C.
Kiddle, Maj. F.
Lawson, Lt.-Col. C. B.
Leake, Maj. J. W.
Leishman, Brev.-Col. Sir W. B., F.R.S.
Luther, Lt.-Col. A. J.
Macdonald Lt.-Col. S.
McMunn, Maj. J. R.
Macpherson, Surg.-Gen. W. G., C.M.G.
Makins, Col. (temp.) G. H., C.B.
Middleton-West, Capt. S. H., I.M.S.
Nash, Lt.-Col. L. T. M.
Needham, Maj. R. A., I.M.S.
Norrington, Maj. H. L. W.
O'Donnell, Col. (temp. Surg.-Gen.) T. J., D.S.O.
O'Grady, Maj. S. De C.
Osborne, Qrmr. and Hon. Lt. J. W.
Pole, G. H., Esq. (British Red Cross Society) (recommended by G.O.C. II. Corps).
Power, Maj. W. M.
Prescott, Maj. J. J. W., D.S.O.
Purser, Maj. L. M.
Rahilly, Capt. J. M. B.
Ryles, Capt. C.
Scott, Lt.-Col. B. H.
Shanahan, Lt.-Col. D. D.
Starr, Lt.-Col. W. H.
Stephens, Maj. F. A.
Tabuteau, Capt. G. G.
Thomsen, Maj. C. G.
Tyndale, Maj. W. F., C.M.G.
Unwin, Maj. T. B.
Wall, Maj. F., I.M.S.
Watkins, Qrmr. and Hon. Capt. J., Res. of Off.
Watts, Maj. B.

Royal Army Medical Corps.

Balfour, Lt. T. H.
Bazett, Lt. H. C.
Bliss, Maj. E. W.
Bowle, Capt. S. C.
Taylor, Lt. (temp.) R. B.
Browne, Capt. T. W.
Buckley, Qrmr. and Hon. Lt. E. J.
Bullock, Lt. (temp.) A. E.
Carrington, Lt. (temp.) A. E.
Carruthers, Capt. V. T.
Carter, Capt. R. St. M.
Charles, Lt. J. P.
Clements, Maj. R. W.
Copeland, Lt.-Col. R. J.
Cowtan, Lt. F. G.
Crawford, Maj. V. J.
Crawford, Lt.-Col. G. S.
Davidson, Lt. F. C.
Dunne, Capt. J. S., D.S.O.
FitzGerald, Maj. FitzG. G.
Forde, Lt.-Col. B.
Fox, Maj. A. C.
Fraser, Capt. A. D.
Freeman, Lt. F. P.
Glanvill, Capt. E. M. (killed in action).
Greenlees, Lt. (temp.) J. R. C.
Greenwood, Maj. A. R.
Griffin, Lt. (temp.) E. H.
Grogan, Capt. J. B.
Gwynne, Lt. J. FitzG.
Hare, Lt. J.
Helm, Lt. C.
Honeybourne, Capt. V. C.
Hooper, Maj. A. W., D.S.O.
Hudleston, Maj. W. E.
Ingram, Lt. (temp.) W. W.
Jackson, Lt. (temp.) J. L.
James, Lt. (temp.) P. W.
Kelly, Capt. C.
Lang, Lt. E. C.
Lloyd Jones, Capt. P. A.
Loughmen, Capt. W. F. M.
Lyon, Lt. D. M.
McCullagh, Lt. W. McK. H.
MacDougall, Maj. A. J.
McLoughlin, Lt.-Col. G. S., D.S.O.
McQueen, Capt. C.
Martin, Lt. (temp.) A.
Martin-Leake, Lt. (temp.) V. C.
Mathews, Lt. (temp.) J. B.
Maurice, Maj. G. T. K.
Meaden, Capt. A. A.
Milne, Lt. (temp.) F. W.
Milne-Thomson, Lt.-Col. A. (T.F.).
Nickerson, Maj. H. W. S., V.C.
O'Keefe, Capt. J. J.
Ormsby, Maj. G. J. A.
Percival, Lt. E.
Phelan, Capt. E. C.
Philippo, Lt. R. B.
Phillips, Capt. T. McC. (died of wounds).
Pickard, Lt.-Col. R.
Pirrie, Lt. I. M.
Pirrie, Lt. R. E. (killed in action).
Potts, Capt. E. T.
Price, Lt. R. B.
Profeit, Maj. C. W.
Purdon, Capt. W. B.
Rattray, Maj. M. MacG.
Richards, Maj. F. G.
Richardson, Lt. M. (died of wounds).
Roberts, Capt. F. E.
Robertson, Capt. H. G.
Rutherford, Maj. N. J. C.
Sampson, Capt. P., D.S.O.
Scott, Capt. T. H.
Silver, Maj. J. P.
Slayter, Maj. E. W.
Soltau, Lt.-Col. A. B.
Steward, Capt. S. J., D.S.O.
Stewart, Lt. (temp.) J. S.
Thurston, Maj. H. S.
Tyrrell, Lt. W.
Waddy, Lt. (temp.) J. R.
Walker, Maj. F. S.
Walshe, Capt. S. J. A. H.
Watson, Lt.-Col. A. A. (Lt.-Col., R.A.M.C., T.F.).
Whitehead, Lt. N. T.
Williamson, Lt. (temp.) J. S.
Wilson, Capt. H. T.
Winder, Maj. J. H. R.
Wright, Capt. W. G.

Indian Army.—Medical Services.

Moorhead, Lt.-Col. A. H., I.M.S.
Sloan, Maj. J. M., D.S.O.
Harvey, Capt. A. W. M., I.M.S.
Jones, Capt. J. B.
Braganza, 3rd Class Assist. Surg. F.
1st Class Sub. Assist. Surg. Muhammad Umar (937).
1st Class Sub. Assist. Surg. Wahidyar Khan (852).

THE CASUALTY LIST.

The casualties among officers in the Expeditionary Force reported from General Headquarters since our last issue include the name of Surgeon-Major Robert Macnamara Cowie, 1st Life Guards, wounded.

THE CONTROL OF ENTERIC FEVER AT HOME.

The War Office, after consultation with the Local Government Board, have decided that a special record is to be kept by military sanitary officers concerning each case of enteric fever occurring amongst soldiers in this country. The objects in view are (1) to ensure that each case is made the subject of inquiry; (2) to provide material for further inquiry where multiple cases occur; (3) to compare the experience of various military units; and (4) to enable a summary to be prepared of the experience of the army as a whole and in different parts of it.

Under the arrangements already made military medical officers are required to inform the medical officer of health of the sanitary district in which troops are stationed of any cases of enteric fever which may occur, and it is important that the medical officer of health should coöperate with these officers and with military sanitary officers in tracing the source of infection and removing any conditions favouring spread of the disease. The medical officer of health will be in a position to give information as to the relationship of each case to causes of infection present in his district, or, if the infection has been contracted elsewhere, to communicate on the subject with the medical officer of health of the district concerned. The War Office and Local Government Board have agreed upon a method of procedure in regard to the forms of record, which can be obtained by medical officers of health of sanitary districts on application to the Local Government Board.

THE COMMANDER-IN-CHIEF ON THE WORK OF THE R.A.M.C.

Field-Marshal Sir John French in his latest despatch pays the following tribute to the medical service of the British Expeditionary Force:—

Since the commencement of hostilities the work of the Royal Army Medical Corps has been carried out with untiring zeal, skill, and devotion. Whether at the front under conditions such as obtained during the fighting on the Aisne, when casualties were heavy and accommodation for their reception had to be improvised, or on the line of communications, where an average of some 11,000 patients have been daily under treatment, the organisation of the medical services has always been equal to the demands made upon it. The careful system of sanitation introduced into the army has, with the assistance of other measures, kept the troops free from any epidemic, in support of which it is to be noticed that since the commencement of the war some 500 cases only of enteric have occurred.

The organisation for the first time in war of motor ambulance convoys is due to the initiative and organising powers of Surgeon-General T. J. O'Donnell, D.S.O., ably assisted by

Major P. Evans, Royal Army Medical Corps. Two of these convoys, composed entirely of Red Cross Society personnel, have done excellent work under the superintendence of regular medical officers. Twelve hospital trains ply between the front and the various bases. I have visited several of the trains when halted in stations, and have found them conducted with great comfort and efficiency. During the more recent phase of the campaign the creation of rest depôts at the front has materially reduced the wastage of men to the line of communications.

Since the latter part of October, 1914, the whole of the medical arrangements have been in the hands of Surgeon-General Sir A. T. Sloggett, C.M.G., K.H.S., under whom Surgeon-General T. P. Woodhouse and Surgeon-General T. J. O'Donnell have been responsible for the organisation on the line of communications and at the front respectively.

THE BRITISH RED CROSS SOCIETY. — The summary of the work for the week ending Feb. 13th states that since the last report ambulances have been despatched to Dunkirk, Boulogne (2), and Havre (3). A touring car has been sent to Calais. The number of hospitals accepted by the War Office to date is 759, containing beds for 20,771, including 210 beds accepted during the past week.

THE HEALTH OF THE NAVAL DIVISION.—The following announcement was made this week by the Secretary of the Admiralty: Rumours in circulation that the general health of the Naval Division in training at the Crystal Palace is unsatisfactory are quite inaccurate. Cases of serious illness of every kind are bound to occur in any large body of men like that of the Naval Division, but on the whole the health of the men has been and is excellent, and there is no reason to anticipate any deterioration in this respect. Out of 8000 men the average sick list is under 150, or less than 2 per cent.

SOLDIERS' AND SAILORS' DENTAL AID FUND.—The objects of this fund are the conservation of the teeth of soldiers and sailors who are already in the Services, and the provision of dental treatment for recruits with defective teeth. Reports both here and from the front testify to the good work which has been done. An appeal for subscriptions which has been issued by the committee should therefore meet with a ready response, and Queen Alexandra has shown her appreciation of the work by heading the subscription list. All the work is voluntary, the Fund pays for artificial teeth, and the dental departments of hospitals and dental surgeons do the filling, extraction, fitting, and so forth. It may be pointed out that at one dental hospital alone 4000 patients were treated from September to December last year, and it is estimated that quite 6000 require to be dealt with immediately. Lady Frederick Conyngham is the honorary secretary, and the address of the Fund is 36, Leicester-square, London, W.C.

SCOTTISH AMBULANCES FOR THE FRONT.—Our Edinburgh correspondent writes: "In order to meet the needs of the great armies being sent from this country to France, and so that the suffering of the sick and wounded may receive the promptest possible care and attention, strenuous efforts are being made by the Red Cross Society to place at the disposal of the War Office an adequate supply of ambulance wagons. That Red Cross workers in Edinburgh and district have been putting their best foot foremost was shown by the splendid 'turn out' last week of fully equipped motor ambulances destined for the front, which paraded the streets and were inspected by Lord Provost Inches. The cars on parade numbered nine, and were part of a convoy of 50 ambulances, motor cycles, and staff cars which are being handed over to the Scottish Branch of the Red Cross Society to the War Office, and which are to proceed to the front as a Scottish column at an early date."

THE SCOTTISH MOTOR AMBULANCE COLUMN.—Our Edinburgh correspondent refers above to the contribution by the Scottish capital towards the gift of motor ambulances from the people of Scotland to the War Office. On Feb. 17th the King inspected the full column of 62 vehicles at Buckingham Palace, and a luncheon was held at the Royal Automobile Club to signalise the event. Sir George T. Beatson, K.C.B., M.D., chairman of the Scottish Branch of the British Red Cross Society, presided over the gathering, and was supported among others by the Duke of Buccleuch, the Hon. A. Stanley (chairman of the executive committee of the British Red Cross Society), Surgeon-General M. W. Russell, A.M.S., and Major Fleming (secretary of the Scottish Branch). The record of the Scottish branch during the war is one of which Scotland may well be proud. All classes have contributed in money or in kind, and the total war fund raised is now over £140,000, of which £80,000 has been devoted to the purchase and upkeep of motor ambulances at the seat of war. Out of the funds 91 ambulance cars have already been provided.

ABERDEEN AND THE WAR.—Our local medical correspondent writes: "Altogether some 2900 wounded soldiers and sailors have been treated in the Aberdeen hospitals, about 380 being Belgian soldiers. In addition to this, between 500 and 600 local soldiers have been treated at the hospitals.—The Aberdeen Burgh Panel Committee have issued a circular to the medical practitioners in Aberdeen regarding the proposed establishment of a central bureau in connexion with the carrying on of the work of service practitioners. The proposed scheme is to have a central bureau to which all calls are to be sent, these calls to be allocated by the bureau amongst civil practitioners who may agree to do the work, always keeping in view as far as possible that practitioners should have their calls in the districts in which they reside. All fees would be collected by the bureau, and after deducting expenses, half would go to the service practitioner and the remaining half to the practitioner who had done the work. If necessary, a central consulting-room would be established. It is proposed that both panel and private practice should be undertaken by the bureau, and the freedom of choice of a doctor would, as far as possible, be given to patients."

ABERDEEN ROYAL INFIRMARY AND THE WAR.—At the annual general meeting of the corporation of the Aberdeen Royal Infirmary and Lunatic Asylum the chairman, Mr. Alexander Duffus, in moving the adoption of the report, said that the year's work had been carried out under very exceptional circumstances. At one time it looked as if the medical and surgical staff would be reduced to one, all the others being mobilised and either away from Aberdeen on service or not available, owing to the claims on them for duty in military hospitals in town. Fortunately, however, an arrangement was come to with the military authorities under which a certain number of the medical and surgical staff were enabled to attend, to a reasonable extent, daily to infirmary work. In August last, in response to a request from the Admiralty, arrangements were made to provide for a certain number of naval casualties. As yet that accommodation has not been required, though 69 cases of naval sick have been treated. When the pressure upon military hospitals in Aberdeen was very great arrangements were made for 50 beds to be available for the more serious of military wounded, and in all 227 soldiers have been admitted and dealt with as infirmary patients. While doing what they could to help, the directors made every effort to safeguard the claims of the civil population for whom the infirmary exists. Thanks were extended to Mr. Scott Riddell, who kindly agreed to act as honorary superintendent when Dr. W. Sinclair was mobilised, also to Miss Edmondson, the matron, for her valuable services at this time. The chairman also congratulated all three senior surgeons of the infirmary, Mr. Riddell upon his services as Red Cross Commissioner for the North of Scotland, Professor J. Marnoch upon the distinction of C.V.O. conferred upon him by His Majesty the King, and Mr. H. M. W. Gray upon his appointment to the post of one of the consulting surgeons at the front.

KING MANOEL AND WOUNDED OFFICERS.—King Manoel is generously providing through the British Red Cross Society a home for wounded officers, and for this purpose Admiral the Hon. Sir Hedworth Meux, Naval A.D.C. to the King and Commander-in-Chief at Portsmouth, has lent his Brighton house. The house is situated at Kemp Town, commanding a fine sea view, and arrangements are being carried out with a view of receiving as many convalescent officers as it will accommodate. King Manoel and Sir Frederick Treves, on the occasion of a recent visit to the town, visited the Indian General Hospital at the Royal Pavilion and inspected the premises of the new hospital.

THE FRENCH RED CROSS.—A letter in another column from Dr. James Donelan explains the organisation of the London branch of the French Red Cross. On the initiative of the French Ambassador this branch of the French Red Cross Society has now been placed under the presidency of the Vicomtesse de La Panouse, the wife of the French Military Attaché. This branch will henceforward be the only representative in London of the union of the three Red Cross societies established in France. An honorary and an executive committee have been formed. The honorary committee is composed of Queen Alexandra, Monsieur Paul Cambon, the French Ambassador, the Duchess of Norfolk, the Duchess of Somerset, and many other influential people. The following constitute the executive committee:—President, Vicomtesse de la Panouse; vice-president, Madame Brasier de Thuy; treasurer general, Comtesse de Saint Seine (wife of the French naval attaché); secretary general, Madame Phalempin. The treasurer is Mrs. N. Lake, the honorary secretaries are Mr. P. A. Wilkins and Mr. C. J. Baker, and the medical referee is Dr. James Donelan. The committee's offices are at 25, Knightsbridge, London, S.W.

AN ENTERIC HOSPITAL FOR CALAIS.—The joint war committee of the British Red Cross Society and the Order of St. John of Jerusalem recently undertook to provide at Calais an enteric hospital of 156 beds for the exclusive use of Belgian soldiers. The complete hospital has now been built in this country and transported to Calais in the short period of three weeks, and it is being set up there by 100 workmen sent over from this country. The hospital consists of six wards of 26 beds each, and is completely equipped. It includes, in addition to the wards, separate nurses' accommodation, a dispensary, a disinfector, a destructor, kitchens and orderlies' barracks, steam laundry, dining hall, and other necessary offices. Supplies of drugs have been despatched from the Red Cross Stores, 83, Pall Mall, together with sterilisers, disinfecting plant, beds and bedding, &c. The hospital and its equipment represent 500 tons of material. This was sent by rail to Dover by five special goods trains and transferred thence to Calais by special Admiralty transport boat. The workmen sent over to erect the hospital were all insured and inoculated, and special housing accommodation and feeding arrangements were made for them before their arrival. The planning and construction in so short a period of this complete hospital reflect much credit upon the stores department of the joint Red Cross committee.

THE AUTOMOBILE ASSOCIATION FRENCH AMBULANCE FUND.—Early in October last it came to the knowledge of the executive committee of the Automobile Association and Motor Union that while the British military authorities were being well supplied with motor ambulances, the French army was sadly lacking in this respect. An appeal was accordingly sent out in November asking members for (1) entire ambulances, (2) cars suitable for conversion into ambulances, and (3) subscriptions towards providing the necessary ambulance bodies, &c. The association then communicated with the Service de Santé de Gouvernement Militaire de Paris, and as a result, on Oct. 27th promised as a first instalment a free gift of 50 ambulances. The response to this appeal has been generous, 230 cars having been offered to the committee. Thirty-eight have already been sent to France, and the second contingent numbers 55. Nearly 1000 members unable to provide cars contributed cash subscriptions totalling over £6000. The cars as offered have been collected by road and rail from all parts of England, Scotland, Ireland, and Wales. The engineering department of the "A. A." has supervised the work of converting and equipping the vehicles for their employment on the battlefield. On Feb. 11th a luncheon was held at the Savoy Hotel to celebrate the despatch of these motor ambulances to France, and subsequently the 55 cars were inspected at Buckingham Palace by the King.

QUEEN'S UNIVERSITY OF BELFAST AND THE WAR.—A roll of honour, compiled by authority of the Senate, has just been published, giving a list of those connected with the University who have served their country in the war and of those who are still fortunately able to act in this way. Among the five killed in action there is one medical officer, Captain T. M. Phillips, R.A.M.C., who died from a shell injury received at Ypres.

BRIGHTON AND HOVE MEDICAL PREPARATIONS AGAINST AIR RAIDS.—Referring in our last issue to the medical preparations against possible air raids on London we stated that with the sanction of the military and police authorities the London scheme had now been elaborated and extended to include vulnerable places on the coast. We have received a copy of the very complete scheme organised by the borough councils of Brighton and Hove, which will bear the cost thereof. In these towns 29 dressing stations having telephonic communication have been established. The organised personnel consists of 78 out of 90 civilian doctors who have volunteered their services gratuitously, a staff of nurses, stretcher-bearers with stretchers from the Home Protection Brigade, and 320 boys from various boys' organisations to act as messengers, or cyclists. The medical man in charge of each dressing station is given authority to arrange the equipment of his station in accordance with his requirements. Each doctor is also supplied with emergency dressing packages. The medical men have been assigned to their allotted stations. Fourteen nursing homes have agreed to receive the surplus injured should they be in excess of those whom the hospitals can accommodate.

ENLARGEMENT OF THE SECOND EASTERN GENERAL HOSPITAL, BRIGHTON.—At the beginning of the war this hospital was mobilised with its arranged number of beds—namely, 520. Since then it has been gradually extended, and now has 1000 beds available. There are five blocks composing the hospital, three surgical and two medical. The former are as follows: The new Brighton and Hove Grammar School in the Dyke-road and the Howard Convalescent Home and St. Mark's Council School at Kemp Town. The medical blocks are at Stanford-road Council School and at Lewes-crescent, Kemp Town. The staff has been augmented, consisting now of about 30 medical and surgical officers. Several thousand patients have already been treated at the different branches, both men from the Expeditionary Force and men from the many large camps in the neighbourhood. There are four operating theatres, at all of which various operations are constantly being performed. A great number of these are on men who have not yet been to the front, but who require some operative procedure to fit them for active service.

LIVERPOOL DOCTORS AND ANTITYPHOID INOCULATION.—At a largely attended meeting of medical practitioners at the Liverpool Medical Institution last week the question of antityphoid inoculation in the army was discussed, and a forcible paper on the subject was read by Professor Ernest Glynn, of which an abstract was sent to the local press. The following resolution was proposed by Captain W. Permewan, R.A.M.C. (T.), and seconded by Lieutenant-Colonel Sir James Barr, R.A.M.C. (T.), and carried unanimously:—

This meeting of the Liverpool Medical Institution expresses its strong conviction that the time has come to make antityphoid inoculation compulsory in the British Army.

A WATER-STERILISING OUTFIT.—We have received from Messrs. Burroughs, Wellcome, and Co. specimens of tabloids of chlorinated lime and sodium thiosulphate together with soloids of potassium iodide and starch. The whole forms an easily portable outfit for the certain sterilisation of water. The procedure is very simple. As a starting point 1 tabloid water steriliser (chlorinated lime) is dissolved in 10 gallons of water, the mixture being allowed to stand for 15 minutes. Then, to ensure that sufficient of the steriliser has been used, a test is made in the following way. A little of the water is placed in a cup or other vessel in which has been placed one soloid containing potassium iodide and starch. If a blue colouration occurs there is an excess of chlorine present and the work of sterilisation is complete. Otherwise another tabloid steriliser must be added until the presence of free chlorine is shown by the soloid potassium iodide starch test. The excess of chlorine is then removed by adding one tabloid of sodium thiosulphate for each tabloid of steriliser and the water becomes fit for drinking and palatable. This is a very ingenious and simple method and should be of the greatest value in a campaign.

IT is reported by the Berne correspondent of the *Times* that Dr. Philipp Peck, head of the Austrian Army Medical Staff, has died from "spotted typhus."

Obituary.

ROBERT BURNET, M.Sc., M.B., CH.B. VICT., M.Sc., M.B., CH.B. LIVERP., D.P.H. BIRM.,

MEDICAL OFFICER OF HEALTH OF CORNWALL; LIEUTENANT-COLONEL, ROYAL ARMY MEDICAL CORPS (T.).

Lieutenant-Colonel Robert Burnet, R.A.M.C. (T.) was killed in Devonshire recently by being thrown from his horse.

Robert Burnet received his professional education at University College, Liverpool. In 1897 he took the B.Sc. at Victoria University with first-class honours and a scholarship, in 1900 the M.B., B.Ch., and in 1901 the M.Sc. In 1902 he was appointed district medical officer of the parish of Birmingham. In 1904 he was admitted to the M.Sc., M.B., and B.Ch. of Liverpool University, and in 1908 he took the D.P.H. at the University of Birmingham. Three months later he was appointed medical officer of health of the county borough of Bury, Lancs., and shortly afterwards superintendent of the large combined isolation hospital there. He developed the work of inspection instituted by his predecessor, Dr. Brindley, and assisted in the establishment of a municipal hospital for tuberculosis. In 1910 he was appointed county medical officer of health of Cornwall. Dr. Burnet took a keen interest in military medical matters. In 1908 he joined the R.A.M.C. (T.) at Handsworth, Staffs., was transferred on going to Bury to the Lancashire Fusiliers, and was again transferred on going to Cornwall, when he was promoted to the rank of lieutenant-colonel.

Dr. A. H. Bygott, of Bury St. Edmunds, writes: "I first met Robert Burnet in 1902, soon after his appointment as district medical officer of the parish of Birmingham, and have been very intimately connected with him ever since. The appointment was remarkable, as the result of a determined attempt by an enlightened board of guardians to organise their outdoor medical department on the best possible lines by availing themselves of whole-time officers at a substantial salary. Dr. Burnet took an especially keen interest in this work and did his best to develop it, but that he felt he had undertaken a practically impossible task is shown by his evidence before the Royal Commission on the Poor-laws, in 1907, in which he suggested that the medical services controlled by the boards of guardians should be transferred to the public health authorities. This policy was adopted in the Minority Report, and he continued to support it on every available occasion. During Dr. Burnet's first year of office as medical officer of health of Cornwall there was a very serious epidemic of poliomyelitis in the county, in the investigation of which he proved himself indefatigable, but in connexion with which he sustained a very serious blow. His only son, a brilliant boy who was destined for the navy, fell a victim to this disease, and though his life was spared after a very serious illness, he was left hopelessly paralysed. Dr. Burnet's early career was a brilliant one. He was a man of varied talents, and possessed no mean gifts as an artist and musician, though the strenuous life that he led in latter years left him scant leisure for them. He was singularly alert, and threw himself with ardour into every detail of whatever he undertook. He was also one of the most conscientious men that I have ever known. A host of friends will mourn their loss, and the deepest sympathy will be felt for his young widow and his children."

PATRICK JOSEPH MACNAMARA, M.D. R.U.I., F.R.C.S. IREL.,

CHAIRMAN OF THE IRISH MEDICAL COMMITTEE.

THE death of Dr. Patrick Macnamara, of Kilmallock, co. Limerick, occurred on Feb. 4th after a few days' illness. He was one of the most representative of Irish country doctors, and his unanimous election on two occasions as chairman of the Irish Medical Committee was a striking proof of confidence in his ability and fairness.

Dr. Macnamara was educated at Cork and Dublin, and became M.D. of the Queen's University and Licentiate of the Royal College of Surgeons in 1872. Fifteen years later he proceeded to the Fellowship of the College. His entire professional life was spent in his native county of Limerick, where for many years past he was a justice of the peace for the county and medical officer of the Kilmallock workhouse. While undertaking all the arduous duties of a country practitioner in Ireland he spared no pains to keep himself abreast of knowledge in medicine, surgery, and midwifery, and in his workhouse hospital he did surgical work of excellent quality. He acquired a reputation in many branches of practice which made his opinion much in request as a consultant and helped him to occupy an important place in public esteem in the south of Ireland, an esteem to which his high personal character contributed largely.

He was for many years an active member of the council of the Irish Medical Association. When, in 1913, the Conjoint Committee, which had up to that time represented Irish medical interests in reference to the National Insurance Act, was dissolved, Macnamara was chosen chairman of the newly constituted Irish Medical Committee. The moment was a critical one for the profession, for the committee contained some very discordant elements, and if a split had occurred all hope of unity in the profession would have vanished. But Macnamara, by his forbearance, tolerance, perfect courtesy, and occasional humour, kept in good temper the meetings over which he presided, and thus placed the profession of Ireland under a debt to him.

JOHN DEE SHAPLAND, M.R.C.S. ENG., L.S.A.

BY the recent death of Mr. John Dee Shapland Exmouth has lost an old resident who witnessed its growth from a comparatively small size to its present dimensions and who was for many years actively engaged in general practice there, being district medical officer from 1891 to 1905.

John Dee Shapland was born at North Molton in North Devon on Nov. 30th, 1839, and was educated at South Molton and Axminster. On leaving school he was articled to Dr. Forrester at Barnstaple, where he remained but a very short time. He then went to University College Hospital, when the medical staff included Jenner, John Erichsen, Sharpey, Quain, and Ellis. After qualifying as M.R.C.S. in 1861 he was for a time assistant to a practitioner in Watford, and later settled in general practice at Thornton Heath, becoming medical officer for the union of Croydon. He left that neighbourhood for North Devon in 1882, settling first at Downrew, near Bishop's Tawton, and removing thence to Burnside, Withycombe, Exmouth, where he resided until his death. A keen sportsman and horticulturist, he was also a good practitioner, and to the end of his working life kept himself well abreast of modern scientific developments.

MICHAEL McHUGH, M.A., M.D. DUB., L.R.C.P. & S. IREL.,

PROFESSOR OF MATERIA MEDICA IN THE SCHOOL OF THE ROYAL COLLEGE OF SURGEONS IN IRELAND.

THE death of Professor McHugh occurred quite unexpectedly on Jan. 8th. He had been about his work as usual on the 7th, but was found dead in bed next morning, death having apparently taken place some hours previously. He was only 58 years of age.

Michael McHugh was educated in Trinity College, Dublin, and afterwards at Berlin and Vienna. He was for many years one of the visiting physicians to St. Vincent's Hospital and the Cork-street Fever Hospital, Dublin, and since the death of Sir George Duffey he had been professor of materia medica and therapeutics in the School of the Royal College of Surgeons. He had been an external examiner in medicine at the University of Dublin, and examiner in medical jurisprudence at the Royal University of Ireland. He had a high reputation as a scientific physician, and although of a retiring disposition, was held in great regard by his pupils and colleagues.

Medical News.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At a meeting of Comitia of the Royal College of Physicians of London on Jan. 28th and of the Council of the Royal College of Surgeons of England on Feb. 11th diplomas of L.R.C.P. and M.R.C.S. were conferred respectively upon 114 candidates (including three ladies) who have passed the Final Examination in medicine, surgery, and midwifery of the Conjoint Board and have complied with the requisite by-laws. The following are the names and schools of the successful candidates:—

Christie Muthuswamy Anthony, Guy's Hospital; Mary Elizabeth Ashton, Calcutta, Manchester University, and Royal Free Hospital; Errington Atkinson, London Hospital; Geoffrey Lewis Attwater, Cambridge University and Guy's Hospital; James Dorrington Bangay, St. Bartholomew's Hospital; Percy William Barnden, London Hospital; Burgess Barnett, St. Bartholomew's Hospital; Kanshi Ram Batra, University College Hospital; Owen Albert Beaumont, Cambridge University and London Hospital; Arthur Leslie Blunt, St. Thomas's Hospital; Harold Esmond Arnison Boldero, Oxford University and Middlesex Hospital; Johannes Willem Bouwer, London Hospital; Leonard Graham Brown and Charles Milwyn Burrell, Oxford University and London Hospital; Harold George Bywater, Liverpool University; Rowland Burnell Campion, Guy's Hospital; Maurice Hereward Cane, Cambridge University and St. Bartholomew's Hospital; Dorothy Chick, Royal Free Hospital; William King Churchouse, Charing Cross Hospital; Joseph Woods Clayton, Adelaide University and London Hospital; Philip Cyril Powter Cloake, London Hospital; William Lonsdale Cockcroft, Manchester University; Stephen Walter Coffin, Guy's Hospital; Dora Challis Colebrook Royal Free Hospital; Ernest James Cooke, Guy's Hospital; Edward Charles Cunnington, Cambridge University and St. Bartholomew's Hospital; Eric David Despard Davies, Cambridge University and St. Mary's Hospital; Alexander Decimus d'Avray, University College Hospital; George Stanley Deane and Cedric Roland Denny, London Hospital; Charles Wilmot Dias, Ceylon Medical College and St. Mary's Hospital; Herman Gerald Dresing, Copenhagen University and Guy's Hospital; Albert John Kingman Drew, Guy's Hospital; Sidney Ernest Elphick, St. Mary's Hospital; Ahmed Zaki Elsayed, Cairo and London Hospital; James Fanstone, London Hospital; Harry Hope Fisk, St. Mary's Hospital; George Muir Foster, Bristol University and University College Hospital; Lewis Salisbury Fry, Cambridge University and Guy's Hospital; Alec Terris Gibb, Manchester University; John Wesley Gilbert, Bristol University; Edmund Douglas Granger, St. Thomas's Hospital; Stanley Willoughby Green, Leeds University; Norman Grellier, Charing Cross Hospital; Herbert Stuart Griffith, St. Bartholomew's Hospital; Douglas Noel Hardcastle, St. Mary's Hospital; William Theodore Hare, Cambridge University and St. Thomas's Hospital; Frank Cecil Harrison, Sheffield University; Hugh Granville Hockridge, St. Bartholomew's Hospital; Lancelot Horsley, Guy's Hospital; Ifan Septimus James, University College Hospital; William Baly Jepson, St. Bartholomew's Hospital; Cyril Oscar Howe Jones, Middlesex and St. Thomas's Hospitals; Dadabhai Nowrojt Kalyanvala, Bombay University and University College Hospital; Charles George Gordon Keane, St. Mary's Hospital; Felix Edward Ricardo Laborda and Stephen Abraham Liebson, Guy's Hospital; Neville Hood Linzee, London Hospital; Percy East Lones, University College Hospital; William Francis MacAlevey, St. Mary's Hospital; Cecil Granville McClymont, Guy's Hospital; James McDonnell, London Hospital; Edmund Claud Malden, Cambridge University and King's College Hospital; George Allan Maling, Oxford University and St. Thomas's Hospital; Robert Charles Matson, Guy's Hospital; Eric Spanton Mawe, Cambridge University and St. Bartholomew's Hospital; Stanley Howard Miles, Cambridge University and St. Thomas's Hospital; Donald Samuel Eccles Milligan and William Hubert Milligan, St. Thomas's Hospital; Arthur Daniel Morris, University College, Cardiff, and University College Hospital; Herbert Guy Moser, St. Bartholomew's Hospital; Drevor Frederick Acton Neilson, Cambridge University and St. Thomas's Hospital; Kenneth Montague Nelson, St. Mary's Hospital; Charles Cyril Okell, Cambridge University and St. Bartholomew's Hospital; James Hales Parry, Cambridge University and Guy's Hospital; Owen Guy Parry-Jones, Oxford University and Guy's Hospital; Sachchidananda Hosen Paul, Calcutta University and Charing Cross Hospital; Hugh Ley Puxon Peregrine, King's College and Guy's Hospitals; Danwattege Don Philip Perera, Ceylon Medical College and University College Hospital; Haydn Peters, Charing Cross and Middlesex Hospitals; George Robinson Pirie, Toronto University; Kenneth Playfair, Cambridge University and King's College Hospital; Guy Algernon Pratt, Guy's Hospital; Oliver Beakley Pratt, Oxford University and St. Bartholomew's Hospital; Hoel Parry Price, Guy's Hospital; Wilfrid Raffle, Cambridge University and London Hospital; Reginald Thompson Raine, Cambridge University and St. Thomas's Hospital; William Leonard Eliot Reynolds, Guy's Hospital; William Kenneth Armstrong Richards, Bristol University; James Albert Robinson, St. Bartholomew's Hospital; Alan Filmer Rook, Guy's Hospital; Harold Arthur Rowell, St. Thomas's Hospital; Arthur Paul Saint, Cambridge University and London Hospital; Noel Humphrey Wykeham Saw and Roland Sells, Guy's Hospital; Henry Richard Sheppard, St. Thomas's Hospital; William Sowerby, University of New Zealand and Middlesex Hospital; Harold Douglas Livingstone Spence, Queen's University, Kingston, and St. Bartholomew's Hospital; Alan Edward Staffurth, Cambridge University and St. Thomas's Hospital; William Fletcher Stiell, St. Thomas's Hospital; Lionel Frederick Strugnell, St. Bartholomew's Hospital; Charles Putnam Symonds, Oxford University and Guy's Hospital; Gordon Stuart Terry, Bristol University; Edgar William Todd, Cambridge University and St. Thomas's Hospital; Myles Denison Boswell Tonks, London Hospital; Oscar Ramsay Unger, University College Hospital; Algernon Randolph Upton, Birmingham University and St. Bartholomew's Hospital; Cedric Norman Vaisey, Bristol University; Joseph Stephen Wallace, University College Hospital; Philip Pennefather Warren, London Hospital; Robert Harvey Williams, St. Bartholomew's Hospital; Samuel Wilson, Guy's Hospital; Frank Hamersley Woods, St. Bartholomew's Hospital; and Henry Wardel Snarey Wright, University College Hospital.

Diplomas in Public Health were also conferred upon the following six candidates:—

Kishori Lal Chandry, Lahore Medical College and University College; Noormahomed Kasembhai Chohan, Bombay and Cambridge Universities; Herbert William Frankhauser, Melbourne University and Royal Institute of Public Health; Thomas Marlin, Glasgow University and University College; Lucy MacBean Ross, Glasgow University and University College; and Andrew James Shinnie, Aberdeen University and University College.

UNIVERSITY OF OXFORD.—The examination for the Diploma in Ophthalmology will commence on July 19th, and for the Diploma in Public Health June 1st. The Board of the Faculty of Medicine gives notice that the Certificates in Anæsthetics (No. 11), Practical Pharmacy (No. 12), and Practical Pharmacology (No. 13) will be accepted on the old forms (see Examination Statutes, p. 232, ed. 1914) at all examinations held before Michaelmas Term, 1916. At the examination in Michaelmas Term, 1916, and afterwards only the new forms of certificate will be accepted.—The following medical degrees have been conferred:—

D.M.—H. P. Newsholme, Balliol.
B.M.—G. W. Carrington, Keble (*in absentiâ*).

PHARMACEUTICAL SOCIETY.—At the February meeting of this society two useful papers recording the results of experiments conducted in the society's research laboratories were communicated. In one of these Professor H. G. Greenish dealt with the problem of the discolouration of sodium salicylate solution by alkalies, a subject which, with Mr. A. E. Beesley as collaborator, he has recently investigated. The fact that a solution of sodium salicylate to which sodium bicarbonate has been added gradually assumes a brownish colour, deepening to dark brown or nearly black, is known to most medical practitioners and to all pharmacists, but it has never been definitely known to what this is due. Mixtures containing these two salts are frequently prescribed, and the matter is therefore of practical interest. It would seem that the discolouration is due to the oxygen of the air acting on the salicylate in the presence of sodium sesquicarbonate, and that the addition of about a grain of sodium sulphite or bisulphite to an ordinary 8 oz. mixture produces a marked preservative effect. Apparently there can be no possible objection to the use of this expedient. In the other paper Professor H. L. Smith

dealt with acetylsalicylic acid, which is one of the drugs that were formerly manufactured almost exclusively in Germany, but are now being made in this country by several manufacturers. Doubt has been expressed by some medical men and others as to the identity of the various makes of acetylsalicylic acid, and especially as to their identity with aspirin, and statements are sometimes made that one sample or another causes secondary effects, such as irritation of the stomach. Except that aspirin differs somewhat in appearance from the acetylsalicylic acid manufactured in Great Britain (aspirin crystals occurring in glistening flakes whilst the others appeared needle-like in form) most of the samples examined were identical with aspirin—that is to say, their chemical composition was the same. The question of the crystalline character is apparently of no particular importance, and Professor Smith's conclusion is that acetylsalicylic acid may be obtained without difficulty, chemically pure, from more than one source, but that, as with other chemicals, indifferent and impure makes are on the market, and therefore the same discrimination should be used in buying it as with other drugs.

THE Mayor of Sunderland has received from a number of medical practitioners of that borough upwards of £230 towards the local contribution to the Prince of Wales's National Relief Fund. This sum represents fees received for the medical examination of recruits.

TYPHUS FEVER IN LONDONDERRY.—Eleven cases of typhus fever have been notified, of which six occurred in one family. The origin of the outbreak has been traced to a "wake" held on Dec. 19th, 1914, at which crowds of persons attended, and all those suffering from typhus fever, with the exception of the district nurse, were present. Every precaution has been taken to stamp out the epidemic, but in addition to other causes of the disease, the district in which the outbreak occurred is almost uninhabitable in consequence of its bad sewerage.

DONATIONS AND BEQUESTS.—The late Miss Jane Osborn has left by will £500 each to the Great Northern Central Hospital and the Central London Ophthalmic Hospital; part of the residue of the estate will go to the Cancer Hospital, Fulham.—By the will of the late Mr. George Hepworth, of Castleford, Yorks, the Clayton Hospital, Wakefield, will receive £500 and the Wakefield City Deaf and Dumb Society £250.—Two donations have been intimated to the Dundee Infirmary, one of £500 from Mr. Andrew Scott with the proviso that only the income should be used and that two cots in the infirmary should be named, and the other of £1000 North British Railway Stock (Ordinary Preference) from Mr. J. J. Watson, Broughty Ferry, the interest only to be used.

UNIVERSITY OF LONDON.—At the last meeting of the Senate the titles of professor and reader in the University of London were conferred upon various teachers of the University on the recommendation of the respective boards of advisers. Mr. J. E. S. Frazer, St. Mary's Hospital, was made professor of anatomy; Dr. T. M. Lowry, Guy's Hospital, professor of chemistry; Dr. W. J. R. Simpson, King's College, professor of hygiene and public health; Mr. Major Greenwood, jun., Lister Institute, reader in medical statistics; Dr. R. G. Hebb, Westminster Hospital, reader in morbid anatomy; Dr. R. T. Leiper, London School of Tropical Medicine, reader in helminthology; Dr. F. S. Locke, King's College, reader in physiology; Dr. H. E. Roaf, St. Mary's Hospital, reader in physiology; Dr. Otto Rosenheim, King's College, reader in biochemistry; Mr. J. Henderson Smith, Lister Institute, reader in bacteriology; Dr. H. M. Turnbull, London Hospital, reader in morbid anatomy; and Dr. J. S. Edkins, Bedford College, reader in physiology. Dr. E. Barclay-Smith was appointed to the University professorship of anatomy at King's College, and Dr. E. P. Cathcart to the University professorship of physiology, tenable at the London Hospital Medical College. The report of the professor of protozoology (Professor E. A. Minchin) for the year ended June 30th, 1914, was received and forwarded to the Colonial Office. A grant of £50 was made out of the Dixon fund to Mr. J. A. Gardner, University of London Physiological Laboratory, for researches into lipoid substances. The following additions were made to the Faculty of Medicine: Mr. R. C. Acland, Professor E. Barclay-Smith, Professor E. P. Cathcart, Mr. R. W. Collum, Mr. T. J. Evans, Mr. R. A. Greeves, Dr. P. Haas, Dr. R. C. Jewesbury, Dr. E. Macnamara, and Mr. C. A. Pannett. It was announced that the Chancellor had reappointed Sir James Barr, M.D., to be his representative upon the Court of Governors of the University of Liverpool. University medals in connexion with the M.D. examination have been awarded to J. N. Mehta (medicine) and J. C. Woods (mental diseases), of the London Hospital.

Dr. Andrew Hunter, a graduate of Edinburgh University, has been recently appointed to the chair of pathological chemistry in the University of Toronto, to succeed Professor J. B. Leathes, who resigned some months ago to accept an appointment in the University of Sheffield. Dr. Hunter was associated with Professor E. A. Schaefer for three years, then went to Cornell University, Ithaca, New York, as associate professor of biochemistry. Subsequently he was appointed biochemist in the United States Public Health Service at Washington, D.C., whence he came to Toronto.

Dr. A. Wood Smith, late physician to the Glasgow Royal Infirmary, has been appointed honorary consulting physician to that institution.

MEDICAL MAGISTRATE.—Dr. Richard Emmett has been placed on the Commission of the Peace for the county borough of Portsmouth.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Naval Medical Compassionate Fund Bill.

A BILL "to make further and better provision with regard to the Naval Medical Compassionate Fund" has been introduced into the House of Commons by Mr. G. LAMBERT, Civil Lord of the Admiralty. It was read a first time.

The text of the Bill has been printed. It is in the following terms:—

Whereas under an Order in Council dated the thirteenth day of August eighteen hundred and seventeen the Naval Medical Supplemental Fund Society was established for the relief of widows of medical officers in the Royal Navy: And whereas it was provided in that Order that if any bequest or donations should be made in favour of the society, the principal amount thereof should be reserved separately as a compassionate fund, and that the interest should be distributed, at the discretion of the President and Court of Directors of the society, among the orphans of deceased members thereof, and that each member of the society, on his promotion or on his appointment to any permanent civil situation, should contribute to the compassionate fund a fee equal to one week's pay: And whereas in pursuance of the Naval Medical Supplemental Fund Society Winding-Up Act, 1861, the society has been wound up, but that Act provided that notwithstanding the winding-up of the society the above-mentioned compassionate fund should continue, but on a voluntary instead of a compulsory basis, and enacted that the interest thereof should be distributed among the orphans of those members of the society who had died and the orphans of those naval medical officers who had theretofore contributed or who should thereafter voluntarily contribute any such fee as aforesaid to the compassionate fund, but that no person should thereafter be compelled or liable to pay a fee to the compassionate fund: And whereas the said Act made no provision for the future management of the said fund, but the said fund has in fact remained under the management of a body consisting of the Secretary to the Admiralty, the Medical Director-General of the Navy, and certain medical naval officers who have contributed to the fund, and now consists of the sum of ten thousand six hundred pounds two and a half per centum consolidated stock: And whereas it is expedient to make provision for the management of the said fund and to alter the terms of contribution thereto and the nature of the benefits therefrom in manner hereinafter appearing:

Be it therefore enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. (1) His Majesty may by Order in Council provide—(*a*) for constituting new trustees of the said fund and for vesting the fund in such trustees; (*b*) for filling vacancies

in the office of trustee and for vesting the fund in the trustees for the time being without conveyance or assignment; (*c*) for vesting the management of the fund, the determination of the persons to receive benefits therefrom, and the distribution thereof amongst such persons, in such body as may be determined by the Order, being a body representative of the naval medical service, either with or without the addition of representatives of the Admiralty; (*d*) for enabling all persons who are or who may hereafter become naval medical officers, or who may at any time have been naval medical officers, to become subscribers to the fund; (*e*) for determining the terms of subscription and the manner and time of payment thereof; (*f*) for making eligible to benefits from the fund the widows and orphans of all persons who at the time of the making of the Order may have contributed to the fund, and, subject to such conditions as may be prescribed by the Order, of persons who may after that date have become subscribers to the fund; and the Order may contain any incidental, consequential, or supplemental provisions which may appear to be necessary or proper for the purposes of the Order. (2) An Order in Council under this Act may be altered or revoked by a subsequent Order in Council.

2. This Act may be cited as the Naval Medical Compassionate Fund Act, 1915.

A schedule to the Bill provides for the repeal of certain provisions in existing enactments.

Report of the Central Midwives Board.

The report on the work of the Central Midwives Board for the year ended March 31st, 1914, has been issued. It is therein stated that the Midwives Roll on March 31st, 1914, contained the names of 37,290 women, an increase for the year of 1727. This latter figure shows a reduction of 211 in the numbers added to the roll during the year, as compared with the previous year. Of the total, 16,989 have passed the Board's examination and 9583 have been admitted to the roll in virtue of prior certification under Section 2 of the Midwives Act. The total number of trained midwives amounts to 26,572 and of untrained to 10,718, the percentages being 71·3 and 28·7. At the same period last year the percentages were 69 and 31 respectively. The proportion of trained midwives increases steadily as the names of the untrained women disappear from the roll, but it must be remembered that a large number of the former, which may be estimated at not less than 60 per cent., do not practise as midwives in England or Wales. As far as can now be estimated the proportions of trained and untrained women in actual practice are about equal. Last year, of those practising as midwives, the untrained exceeded the trained.

HOUSE OF COMMONS

WEDNESDAY, FEB. 10TH.

Vaccination and Small-pox.

Mr. YEO asked the President of the Local Government Board whether he was aware that more than half the children born in England and Wales were now escaping vaccination and that small-pox had been almost entirely absent since the passing of the Vaccination Act, 1907; and, if so, whether he would consider the desirability of arranging that vaccination should now be entirely voluntary.—Mr. HERBERT SAMUEL replied: The statements in the first part of the question are substantially correct, except that there was no marked change in the number of deaths from small-pox following upon the passing of the Vaccination Act, 1907. It is not the intention of the Government to introduce legislation on the subject.

St. John Ambulance Brigade.

Replying to Mr. THOMAS, Mr. H. BAKER (Financial Secretary to the War Office) said: All men of the St. John Ambulance Brigade who are employed in military hospitals are enlisted for the Royal Army Medical Corps and are treated for pay and allowances, including separation allowance, in all respects as regular soldiers.

Drug Accounts Regulations in Scotland.

Mr. PRINGLE asked the Prime Minister whether his attention had been called to an interdict granted by Lord Anderson in the Court of Session on Feb. 2nd on the application of the Glasgow Insurance Committee ordaining the Scottish Insurance Commissioners to cancel any directions given by them for laying the National Health Insurance (Drug Accounts Committee) Regulations (Scotland), 1914, before both or either of the Houses of Parliament; whether the application was made and granted on the ground that no petition against the Order was possible in this House because the Government was to occupy the whole time of the House; whether under the Order of Feb. 3rd the opportunity to petition against Orders and Regulations laid upon the table of the House had been taken away; and, if so, whether the Government would propose an amendment of the Order of Feb. 3rd whereby the right to petition against Orders and Regulations laid upon the table would be restored.—Mr. ASQUITH furnished the following written reply: My attention has been called to the matter referred to. It must not be taken to accept the statements made in the second branch of the question, but the grounds on which the application was made are, I believe, accessible to my honourable friend. As under the Order of Feb. 3rd, no opportunity would arise of discussing petitions against such Orders and Regulations, the Government will endeavour to make some arrangement that time should be given when discussion is necessary and desirable.

Health of the Army.

Speaking in the course of the debate on army estimates,

Mr. TENNANT (Under Secretary for War) made reference to the service rendered to the country, and particularly to the War Office and the Royal Army Medical Corps, by the British Red Cross Society, the St. John Ambulance Association, and voluntary agencies generally all over the country. He should like to endorse the eulogy which had been passed on them by the noble lord the Member for Hitchin (Lord Robert Cecil). He (Mr. Tennant) had tendered his acknowledgment of the admirable manner in which they had helped in every possible way. It was a pleasing fact that the St. John Ambulance Association and the British Red Cross Society, which were previously acting in rivalry the one with the other, were now working under a joint committee, which tended, of course, to more efficient work being achieved by both. The question had been raised of the evacuation of hospitals at Boulogne and elsewhere, and it had been suggested that the wounded had been moved too early from these hospitals in order to make room for others. That was a real difficulty. The War Office authorities were anxious that the sick and wounded should be left in the base hospitals as long as possible, and so much so was that the case that if he mentioned the fact that recently only 700 odd beds were vacant at Boulogne, he thought that it would be accepted as proof of the excessive care taken to keep the sick and wounded in the base hospitals and to prevent their removal too early. (The remarks of the right honourable gentleman on the subject of the inoculation of the troops against typhoid were summarised in last week's issue of THE LANCET.)

Mr. W. LONG expressed regret at the delay of the Government in coming to a decision on the question of making inoculation compulsory in the army. For future recruits inoculation ought to be made compulsory.

THURSDAY, FEB. 11TH.

Recoveries of Wounded Soldiers.

Sir GEORGE SCOTT ROBERTSON asked the Prime Minister how many out of the 104,000 casualties in the Expeditionary Force had now returned to duty.—Mr. ASQUITH replied: I fear that it would be contrary to the public interest to give exact figures, but my honourable friend and the House will be glad to know that about 60 per cent. of the wounded recover and become fit for service.

Treatment of Nerve Strain amongst Soldiers

Mr. DUNCAN MILLAR asked the Under Secretary for War whether the Red Cross military hospital which had been opened in Lancashire for the reception of uncertifiable soldiers suffering from nerve strain was solely under War Office control, or whether it was visited by Lunacy Commissioners and under lunacy administration.—Mr. TENNANT answered: The hospital referred to is an exclusively military hospital, and the reception, care, and discharge of the soldiers admitted are under the sole control of the War Office. The soldiers are not certified and are not under lunacy jurisdiction. The premises, however, are the property of the Board of Control, and some members of the Board visit the institution from time to time in order to supervise such matters as supplies, heating, repairs, and the maintenance of the premises, but they in no way concern themselves with the treatment of the patients.

Non-inoculated Soldiers.

Mr. TICKLER asked the Under Secretary for War whether he was aware that men who had joined Kitchener's Army, now in training at Brocklesby, had been informed that unless they consented to be inoculated against typhoid they would not be allowed to proceed to the front with their companions; and whether this was in accordance with the instructions of the War Office.—Mr. TENNANT answered: No such circumstances as the honourable gentleman describes have been reported. I stated in an answer to the Member for Haggerston on Nov. 23rd the position of inoculated men as regards the probability of their proceeding to the front. The matter remains as it then stood.

The Rum Ration.

Mr. CURRIE asked the Under Secretary for War whether rum was issued as a ration to troops at the front; if so, under what conditions it was issued; whether young men were forced in any circumstances to take rum as a ration; whether he was aware that there was a popular belief to this effect; and, if so, whether he would cause public contradiction of the belief to be made in view of its prejudicial effect upon recruiting.—Mr. TENNANT said in reply: I would

refer the honourable Member to the full answer which I gave on Nov. 16th. I think the true state of the case should be sufficiently clear, but I may repeat that men are not forced to take rum as a ration.

Mr. CURRIE: Would the right honourable gentleman be good enough to communicate a copy of his answer to Sir Thomas Barlow, the President of the Royal College of Physicians, who, if correctly reported in the *Times* of the 9th inst., entertains an extraordinary conception?—Mr. TENNANT: Yes, Sir, I shall be very glad to do so.

Prevention of Dope Poisoning in Aircraft Factories.

Mr. ROWLANDS asked the Under Secretary of State for the Home Department whether he received a report of the inquest held at Crayford on Jan. 8th in connexion with the death from dope poisoning of a young woman employed in varnishing the wings of aeroplanes; whether any similar cases had occurred; and whether measures had been successfully taken to ensure the safety of the workers using dope.—Mr. CECIL HARMSWORTH answered: Several cases of this poisoning occurred at one or two aircraft factories towards the end of last year, and at the Home Secretary's request a full investigation was made by Dr. Willcox, senior analyst to the Home Office, and Dr. Legge, medical inspector of factories. Their inquiries showed that the poisoning was caused by the fumes given off by the varnish, and could be prevented by the installation of a suitable system of ventilation which would effectually carry off the fumes. Steps were immediately taken in concert with the Admiralty and the War Office to secure the provision of effective means of ventilation in every aircraft factory where the dope is being used, and there is every reason to believe that these measures will be successful. No further case of poisoning has been reported since the one referred to by my honourable friend.

Mr. ROWLANDS: Are the authorities thoroughly well satisfied that the precautions taken will secure the safety of the lives of those engaged in this occupation of varnishing, and will there be an official report of the examination and inquiry?—Mr. CECIL HARMSWORTH: I understand that the authorities are thoroughly satisfied with the precautions now being taken.

Medical Inspection of School Children.

Sir W. BYLES asked the President of the Board of Education whether, in accordance with Section 13 of the Education (Administrative Provisions) Act, 1907, and Section 3 of the Employment of Children Act, 1903, he would at once direct all rural education authorities to provide for the medical inspection of all children leaving school for agricultural employment and direct them to prepare and serve on the employer of each child such certificate as was contemplated by the Acts cited and justified by the condition of health and education of the child; and whether he would order that the full details of each case should be immediately reported to the Board of Education and publish them in a Parliamentary paper weekly during the continuance of the war.—Mr. J. A. PEASE said in reply: Provision is already made in the code for the medical inspection of all children after reaching the age of 12, and no facts have been brought to my notice which would justify the imposition upon all local education authorities of such an addition to the work of school medical service as my honourable friend suggests. Any inquiry as to the Employment of Children Act, 1903, should be addressed to the Home Secretary.

Mr. W. THORNE: What happens when children leave the school below the age of 11? Is there any medical inspection then?—Mr. PEASE: Not if they leave at 11, but under the Robson Act there should only be a partial exemption at 11. There ought to be two medical inspections before the age of 11. If they leave at 11 they may escape the third or final medical inspection, which takes place at the age of 12.

Cases of Diphtheria.

Mr. FELL asked the President of the Local Government Board whether his attention had been called to the numerous cases of diphtheria which were occurring in various parts of the country; whether he was making inquiry into the causes of this outbreak; and whether he proposed to issue any instructions dealing with the matter.—Mr. HERBERT SAMUEL replied: Although in the last quarter of 1914 the number of cases of diphtheria was somewhat in excess of that for 1913, I am glad to state that the number of cases notified in England and Wales during the first five weeks of this year is about 1000 less than the number notified in the corresponding period last year. Returns of notified cases are received weekly from each district. These are examined, and it is a matter of routine practice in my department to call for special reports on outbreaks, and if necessary to direct a medical inspector to make a local investigation.

Mr. FELL: Is it not the case that there have been numerous outbreaks in some places, and have not a good many deaths occurred during the past few weeks?—Mr. H. SAMUEL: I am informed that the cases of diphtheria are distributed over a very large number of areas, and that there have been few considerable outbreaks in any particular localities.

Royal Commission on Sewage Disposal.

Replying to Sir J. YOXALL, Mr. H. SAMUEL said: The final report of the Royal Commission on Sewage Disposal has now been signed and will be issued shortly.

MONDAY, FEB. 15TH.

Diseases amongst the Troops.

In reply to Mr. ROWLANDS and Mr. W. THORNE, who asked for particulars as to the cases and deaths among the Expeditionary Force from disease since the outbreak of war, Mr. TENNANT said that he would furnish them with a return on the subject. It is as follows:—

Return showing the Number of Cases and Deaths amongst the Expeditionary Force and the British Troops in the United Kingdom owing to Certain Diseases, from August 1st, 1914.

—		Typhus fever.	Typhoid fever.	Cholera.	Small-pox.	Scarlet fever.	Diphtheria.	Measles.	Dysentery.	Pneumonia.	Cerebro-spinal meningitis.
Expeditionary Force.[1]	Cases	0	625[4]	0	*	196	*	175[3]	*	*	*
	Deaths	0	49[4]	0	*	4	*	2[3]	*	*	*
British troops in the United Kingdom.[2]	Cases	0	262	0	1	1379	783	1045	215	1508	62
	Deaths	0	47	0	0	22	6	65	1	301	26

[1] The figures in this class include cases and deaths up to Feb. 11th, 1915.
[2] The figures in this class include cases and deaths up to Jan. 31st, 1915.
[3] These figures include Indian troops—cases 5, deaths 0.
[4] These figures include Indian troops—cases 25, deaths 4.
* Returns for these diseases are not at present available.

There have been no cases of cholera or of typhus either in the Expeditionary Force or amongst the British troops in the United Kingdom.

Inoculation in the Army.

Replying to Mr. PETO, Mr. TENNANT said that he was not in a position to announce any change of policy with reference to the inoculation against typhoid fever of officers and men in the army, but he would like to inform the House that 97 per cent. of the 29th Division had been inoculated.

The Enlistment of Medical Students.

Mr. MCCALLUM SCOTT asked the Under Secretary of State for War whether he was aware that the calling out of numbers of medical students in the Territorial Force and their enlistment in other forces were likely to result in a shortage of doctors at an early date, to the injury both of the nation and of the army; whether since this fact became known many medical students had been willing to return from the army to the universities in order to qualify as medical practitioners at the earliest possible date; and whether the Secretary of State was prepared to permit such persons to resume their medical course.—Mr. TENNANT replied: Arrangements have been made for the return to their professional studies of medical students serving in medical units of the Territorial Force. Students in their final year of study who have only their final examinations to pass may also be released from the combatant corps if they apply.

TUESDAY, FEB. 16TH.

Medical Officers of the Territorial Force.

Mr. ROBINSON asked the Under Secretary of State for War whether, in view of the fact that medical men fresh from the schools received 24*s.*—more than a major's pay—whilst medical officers who had for years been training with the Territorial Force and had in many cases left large practices received only the pay of their rank and neither the allowances granted in the field, the £60 gratuity at termination of the war, nor prospect of pension, he would cause inquiry to be made with a view to more equitable treatment being given to the more experienced officers.—Mr. TENNANT answered: As I have already explained, it may be found necessary to give special rates to officers commissioned on emergency, but there is no intention of making this universal. I should add that a major of the Royal Army Medical Corps receives 28*s.* a day in pay and field allowance, while the medical officer specially commissioned receives 24*s.* inclusive of all cash allowances.

WEDNESDAY, FEB. 17TH.

Frost-bite amongst the Troops.

Mr. SANDERSON asked the Under Secretary of State for War whether he could state the number of cases of frost-bite among the troops of the Expeditionary Force; whether any, and if so how many, waterproof stockings or trench-waders

had been furnished to such troops; and whether any oilskin coats to wear with the same had been supplied in place of the usual army greatcoats.—Mr. TENNANT said in reply: The total casualties from frost-bite to Jan. 24th last amount to 9175. Large numbers of gum boots and similar articles and waterproof coats and capes have been provided in addition to the usual army boots and greatcoats.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

AUSTIN, E. C., F.R.C.S. Eng., L.R.C.P. Lond., has been appointed Medical Superintendent of the Withington Poor-law Institution.

DANIELS, DAVIS, M.D., B.S. Lond., F.R.C.S. Eng., has been appointed a Senior Surgeon to the Mansfield General Hospital.

JOHNSON, J. STAFFORD, M.B., B.Ch. N.U.I., has been appointed Temporary Resident Surgical Registrar at the Richmond, Whitworth, and Hardwicke Hospitals.

MCFARLAN, W. H., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Hawes District of the county of Yorks, North Riding.

NEALE, T. NORMAN, L.A.H. Dub., has been appointed Dispensary Medical Officer for the Powerscourt District, Dublin.

PICK, LAWRENCE, M.R.C.S., L.R.C.P. Lond., has been appointed Assistant Schools Medical Officer to the Barry Education Committee.

POLLOCK, J. H., M.B., B.Ch. N.U.I., has been appointed Temporary Resident Pathologist at the Richmond, Whitworth, and Hardwicke Hospitals.

SALTER, C. E., M.D. Lond., F.R.C.S. Eng., has been appointed Temporary Assistant Medical Officer of Health and Assistant School Medical Officer for Scarborough.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

ASHTON-UNDER-LYNE DISTRICT INFIRMARY AND CHILDREN'S HOSPITAL.—Senior House Surgeon. Salary £140 per annum, with board, residence, washing, &c.

BARROW-IN-FURNESS, NORTH LONSDALE HOSPITAL.—House Surgeon. Salary £150 per annum, with residence, board, and laundry.

BEXLEY, KENT, LONDON COUNTY ASYLUM.—Locum Tenens Medical Officer. Salary 6 guineas a week, with quarters, board, and washing.

BIRKENHEAD AND WIRRAL CHILDREN'S HOSPITAL, Woodchurch-road.—House Surgeon. Salary £100 per annum, with board, residence, and laundry.

BIRKENHEAD BOROUGH HOSPITAL.—Senior House Surgeon. Salary £120 per annum, with board and laundry. Also Junior House Surgeon. Salary £100 per annum, with board and laundry.

BIRMINGHAM CITY MENTAL HOSPITAL, Rubery-hill.—Female Junior Assistant Medical Officer. Salary £200 per annum, with apartments, board, laundry, &c.

BIRMINGHAM GENERAL DISPENSARY.—Resident Medical Officer, unmarried. Salary £240 per annum, with apartments, fire, lights, and attendance.

BIRMINGHAM, YARDLEY-ROAD SANATORIUM AND ANTI-TUBERCULOSIS CENTRE.—Third Assistant Medical Officer. Salary £200 per annum, with board and residence.

BLACKBURN AND EAST LANCASHIRE ROYAL INFIRMARY.—House Surgeons, Senior and Junior. Salaries £150 and £130 per annum, with board, residence, and laundry.

BOOTLE COUNTY BOROUGH.—Temporary Clinical Tuberculosis Officer. Salary at rate of £400 per annum.

BRADFORD CHILDREN'S HOSPITAL.—House Surgeon. Salary £120 per annum, with board, residence, and laundry.

BRIDGWATER HOSPITAL.—House Surgeon, unmarried. Salary at rate of £125 per annum, with board, lodging, and washing.

BRISTOL EYE HOSPITAL.—House Surgeon. Salary £100 per annum, with board, residence, and laundry.

BRISTOL GENERAL HOSPITAL.—Resident Obstetric Officer for six months. Salary at rate of £120 per annum, with board, residence, &c.

BRISTOL ROYAL INFIRMARY.—Throat, Nose, and Ear House Surgeon. Salary at rate of £120 per annum, with board, apartments, and laundry.

BROADMOOR STATE CRIMINAL LUNATIC ASYLUM, Crowthorne, Berks.—Assistant Medical Officer, unmarried. Salary £250 per annum, with board, rooms, washing, and attendance.

BURNLEY, VICTORIA HOSPITAL.—House Surgeon. Salary £135 per annum, with residence, board, and washing.

BURSLEM, HAYWOOD HOSPITAL.—Female Resident Medical Officer. Salary £100 per annum, with board, residence, and laundry.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, residence, and washing.

CANCER HOSPITAL, Fulham-road, S.W.—House Surgeon for six months. Salary £100 per annum.

CANTERBURY, KENT COUNTY ASYLUM, Chartham.—Third Junior Assistant Medical Officer. Salary £250 per annum, with quarters, board, washing, &c.

CARMARTHEN, JOINT COUNTIES ASYLUM.—Temporary Second Assistant Medical Officer. Salary at rate of £200 per annum, with board, lodging, washing, &c.

CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, W.C.—House Surgeon. Salary at rate of £50 per annum, with board and residence.

CHESTER, CITY AND COUNTY OF THE CITY OF.—Assistant Medical Officer of Health. Salary £300 per annum.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria Park, E.—House Physician for six months. Salary at rate of £75 per annum, with board, residence, and washing. Also Resident Medical Officer. Salary £200 per annum, with board, &c.

CLAYBURY, LONDON COUNTY ASYLUM, Woodford Bridge, Essex.—Fifth Assistant Medical Officer, unmarried. Salary £200 per annum, with board, apartments, and washing.

DARLINGTON HOSPITAL AND DISPENSARY.—House Surgeon. Salary £150 per annum, with board, attendance, and laundry.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board and laundry.

DEWSBURY AND DISTRICT GENERAL INFIRMARY.—House Surgeon. Salary £170 per annum, with board, residence, and laundry.

DUBLIN, SCHOOL OF PHYSIC, TRINITY COLLEGE.—Mary Louisa Prentice Montgomery Lectureship in Ophthalmology. Salary about £160 per annum.

DUDLEY, GUEST HOSPITAL.—Senior Resident Medical Officer. Also Assistant House Surgeon for six months. Salary £150 and £120 per annum respectively, with board, residence, attendance, and washing.

DUMFRIES AND GALLOWAY ROYAL INFIRMARY.—Female Resident House Surgeon. Salary £120 per annum.

EAST HAM, COUNTY BOROUGH OF.—Tuberculosis Officer. Salary at rate of £500 per annum.

ECCLES AND PATRICROFT HOSPITAL.—House Surgeon, unmarried. Salary £70 per annum, with board, lodging, and washing.

EXETER, ROYAL DEVON AND EXETER HOSPITAL.—Senior House Surgeon for 12 months. Also House Physician and Assistant House Surgeon for six months. Salary at rate of £250 per annum for senior post and £150 for junior posts, with board, apartments, and washing.

FIJI (THE GILBERT AND ELLICE ISLANDS PROTECTORATE AND THE SOLOMON ISLANDS PROTECTORATE).—Three Medical Officers. Salary £350 per annum, free quarters provided.

GLAMORGAN COUNTY COUNCIL.—Medical Officer for Inspection of Children in Public Elementary Schools. Salary at rate of £300 per annum.

GLASGOW ROYAL MATERNITY AND WOMEN'S HOSPITAL.—Two Indoor House Surgeons and Two Outdoor House Surgeons at the Hospital, and One Outdoor House Surgeon at the West End Branch (which is open only to Lady Graduates); indoor appointments for six months, and outdoor for three months.

GREAT YARMOUTH HOSPITAL.—House Surgeon, unmarried. Salary £200 per annum, with board, lodging, and washing.

HALIFAX ROYAL INFIRMARY.—Second and Third House Surgeons, unmarried. Salary £120 and £100 per annum respectively, with residence, board, and washing.

HOLBORN UNION INFIRMARY, Archway-road, N.—Second Assistant Medical Officer. Salary £150 per annum, with board, apartments, and washing.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.—Assistant Casualty Medical Officer, unmarried, for six months. Salary £30, with board, residence, &c.

HULL, CITY AND COUNTY OF KINGSTON-UPON-HULL.—Temporary Senior Tuberculosis Medical Officer. Salary at rate of £500 per annum.

HULL, VICTORIA CHILDREN'S HOSPITAL, Park-street.—Resident House Surgeon and Resident Assistant House Surgeon. Salary £60 and £50 per annum respectively, with board and laundry.

INVERNESS, NORTHERN INFIRMARY.—House Surgeon. Salary £100 per annum, with board, &c.

LABORATORIES OF PATHOLOGY AND PUBLIC HEALTH.—Bacteriologist. Salary £170 per annum.

LEICESTER ROYAL INFIRMARY.—House Physician. Salary at rate of £120 per annum.

LINDSEY (LINCOLNSHIRE) COUNTY COUNCIL.—Combined Temporary Assistant Tuberculosis and Assistant School Medical Officers. Salary at rate of £300 per annum.

LIVERPOOL CITY HOSPITAL, Grafton-street.—Visiting Physician. Salary at rate of £130 per annum.

LIVERPOOL, CITY OF.—Locum Tenens School Medical Officer. Salary 6 guineas per week.

LIVERPOOL COUNTY ASYLUM, Rainhill, near Liverpool.—Temporary Assistant Medical Officer. Salary £6 6s. per week, with apartments, board, attendance, and washing.

LONDON COUNTY COUNCIL LEWISHAM CENTRE FOR THE DENTAL TREATMENT OF SCHOOL CHILDREN, 46, Rushey-green, S.E.—Anæsthetist one half-day every fortnight. Salary £25 per annum.

LIVERPOOL, ROYAL SOUTHERN HOSPITAL.—Three House Surgeons and Two House Physicians, each for six months. Salary at rate of £60 per annum, with board and residence.

LONDON HOSPITAL, E.—Assistant Surgeon.

MANCHESTER, COUNTY ASYLUM, Prestwich.—Assistant Medical Officer, unmarried. Salary £250 per annum, with board, apartments, attendance, and washing.

MANCHESTER, ST. MARY'S HOSPITALS FOR WOMEN AND CHILDREN.—Resident Surgical Officer. Salary £90 per annum, with board and residence. Also House Surgeon for three or six months. Salary at rate of £70 per annum, with board and residence. Also House Surgeon at Whitworth-street West Hospital for three or six months. Salary at rate of £70 per annum, with board and residence.

METROPOLITAN BOROUGHS OF HACKNEY AND STOKE NEWINGTON.—Tuberculosis Officer. Salary at rate of £500 per annum.

MIDDLESEX COUNTY ASYLUM, Napsbury, near St. Albans.—Temporary Assistant Medical Officer. Salary 6 guineas per week, with board, lodging, washing, and attendance.

MIDDLESEX EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary at rate of £300 per annum.

MILE END OLD TOWN INFIRMARY.—Senior Assistant Medical Officer and Junior Assistant Medical Officer. Salary £200 and £150 per annum respectively, with board, lodging, and washing.

MILLER GENERAL HOSPITAL FOR SOUTH-EAST LONDON, Greenwich-road, S.E.—Junior House Surgeon for six months. Salary £85 per annum, with board, residence, and laundry.

NEWPORT (MON.), ROYAL GWENT HOSPITAL.—Resident Medical Officer. Salary for first six months at rate of £100 per annum, second six months £125, and third six months £150, with board, residence, and laundry.

NORFOLK EDUCATION COMMITTEE.—Assistant Medical Officer. Salary £300 per annum.

NOTTINGHAM GENERAL HOSPITAL.—Senior House Physician. Salary £120 per annum with board, residence, and laundry. Also Assistant House Physician for six months. Salary at rate of £100 per annum, with board, residence, and laundry.

PADDINGTON GREEN CHILDREN'S HOSPITAL, London, W.—House Surgeon. Salary at rate of £80 per annum, with board, residence, and washing.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—Assistant Resident Medical Officer for four months. Salary at rate of £50 per annum, with board, residence, and washing.

ROCHESTER, ST. BARTHOLOMEW'S HOSPITAL.—Senior Resident House Surgeon, unmarried. Salary at rate of £300 per annum, with board, residence, and laundry.

ROYAL ARMY MEDICAL CORPS (TERRITORIALS), THIRD 1ST HOME COUNTIES FIELD AMBULANCE (Maidstone).—Seven Medical Men as Officers.

ROYAL EYE HOSPITAL, Southwark.—House Surgeon. Board and quarters, &c.

ROYAL HOSPITAL FOR DISEASES OF THE CHEST, City-road, E.C.—Clinical Assistant in Out patient Department.

ROYAL WATERLOO HOSPITAL FOR CHILDREN AND WOMEN, S.E.—Second Resident Medical Officer. Salary at rate of £100 per annum, with board and washing. Also Temporary Honorary Assistant Physician to Out-patients.

ST. MARY'S HOSPITAL FOR WOMEN AND CHILDREN, Plaistow, E.—Junior Resident Medical Officer. Salary at rate of £90 per annum, with board, residence, and laundry.

ST. PETER'S HOSPITAL FOR STONE, &c., Henrietta-street, Covent Garden, W.C.—Junior House Surgeon for six months. Salary at rate of £75 per annum, with board, lodging, and washing.

SALFORD ROYAL HOSPITAL.—Casualty House Surgeon. Salary at rate of £100 per annum, with board and residence.

SALISBURY GENERAL INFIRMARY.—House Surgeon and Assistant House Surgeon, unmarried. Salary £100 and £75 per annum respectively, with apartments, board, lodging, and washing.

SCARBOROUGH HOSPITAL AND DISPENSARY.—Senior and Junior House Surgeons. Salary £100 and £80 per annum respectively, with board, residence, &c.

SHEFFIELD CHILDREN'S HOSPITAL.—House Surgeon. Salary £150 per annum, with board and residence.

SHEFFIELD ROYAL HOSPITAL.—Female Assistant House Surgeon and Female Assistant House Physician. Salary £85 and £80 per annum respectively, with board, residence, and washing.

SHEFFIELD ROYAL INFIRMARY.—House Surgeon and Assistant House Physician. Salary £100 per annum, with board and residence.

SHEFFIELD, SOUTH YORKSHIRE ASYLUM, Wadsley.—Locum Tenens Assistant Medical Officer. Salary as arranged, with apartments, board, &c.

SHREWSBURY, ROYAL SALOP INFIRMARY.—House Physician. Salary at rate of £110 per annum, with board and apartments.

SOUTH AFRICA, FRERE HOSPITAL, East London.—Resident Medical Officer, unmarried. Salary £300 per annum, with board, lodging, and washing.

SOUTHAMPTON, ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL.—Junior House Surgeon for six months. Salary at rate of £120 per annum, with rooms, board, and washing.

SOUTH LONDON HOSPITAL FOR WOMEN.—Female Assistant Physician.

SOUTH SHIELDS, INGHAM INFIRMARY AND SOUTH SHIELDS AND WESTOE DISPENSARY.—Junior House Surgeon. Salary £115 per annum, with residence, board, and washing.

STOCKPORT INFIRMARY.—Junior House Surgeon. Salary £100 per annum, with board, washing, and residence.

SUNDERLAND ROYAL INFIRMARY, CHILDREN'S HOSPITAL.—Female Resident Medical Officer for six months. Salary £100 per annum, with board, residence, and laundry.

SWANSEA UNION INSTITUTION.—Resident Assistant Medical Officer. Salary £295 per annum.

TAUNTON AND SOMERSET HOSPITAL, Taunton.—Senior House Surgeon. Salary £120 per annum, with board, lodging, and laundry.

TRURO, ROYAL CORNWALL INFIRMARY.—House Surgeon, unmarried. Salary £150 per annum, with rooms, board, and washing.

WAKEFIELD CLAYTON HOSPITAL.—Female Junior House Surgeon. Salary £120 per annum, all found.

WALSALL AND DISTRICT HOSPITAL.—Female Assistant House Surgeon and Anæsthetist. Salary £110 per annum, with board, residence, and laundry.

WARWICK COUNTY LUNATIC ASYLUM.—Temporary Assistant Medical Officer. Salary £6. 6s. per week, with board, &c.

WARRINGTON INFIRMARY AND DISPENSARY.—Senior House Surgeon. Salary at rate of £200 per annum, with board, apartments, and laundry.

WEI-HAI-WEI COLONY.—Medical Officer. Salary £300 per annum, with free unfurnished quarters, &c.

WEST BROMWICH AND DISTRICT HOSPITAL.—House Surgeon and Assistant House Surgeon, unmarried. Salary £150 and £120 per annum respectively, with residence, board, and laundry.

WEST HAM AND EASTERN GENERAL HOSPITAL, Stratford, E.—Junior House Surgeon. Salary at rate of £100 per annum, with board, residence, and washing.

WEST RIDING OF YORKSHIRE, CARDIGAN SANATORIUM, near Wakefield.—Assistant Medical Officer. Salary £300 per annum, with partial board.

WHITEHAVEN AND WEST CUMBERLAND INFIRMARY.—House Surgeon. Salary £150 per annum, with board, lodging, and attendance.

WIGAN, ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY.—Female Junior House Surgeon. Salary £130 per annum, with board, apartments, and washing. Also House Surgeon. Salary £170 per annum, with board, apartments, and washing.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Ballinrobe, in County Mayo; at Llansawel, in the county of Carmarthenshire; at Rathgormuck, in County Waterford; at Silvereagh, in County Cork; at Southwold, in the county of Suffolk; and at Tarbert in the county of Argyllshire.

Births, Marriages, and Deaths.

BIRTHS.

FORSTER.—On Feb. 11th, at Woodhill, Crowthorne, Berks, the wife of Lieutenant C. M. Forster, R.A.M.C., of a daughter.

SMYTH.—On Feb. 13th, at Southcroft, Manor-road, High Barnet, the wife of Francis Radway Smyth, M.R.C.S., L.R.C.P., of a daughter.

WYARD.—On Feb. 13th, 1915, at 6, Connaught Mansions, Battersea Park, S.W., to Constance Enid, wife of Lieutenant Stanley Wyard, M.D., M.R.C.P., a daughter.

MARRIAGES.

GUNN—MACDONALD.—On Feb. 6th, at the Catholic Apostolic Church, Edinburgh, James Turner Gunn, M.B., Ch.B., F.R.C.S. Edin., to Adelaide Lucy Frances, only daughter of Mr. and Mrs. N. D. Macdonald, Coll-Earn, Auchterarder.

SKRIMSHIRE—LOGAN.—On Jan. 16th, at St Paul's Church, Poona, Francis Robert Bradley Skrimshire, Captain R.A.M.C., to Nona Jean, youngest daughter of the late C. B. Logan and of Mrs. Logan, Westmarch, Torquay.

DEATHS.

HUNTER.—On Feb. 4th, at 31, St. James-street, Paisley, N.B., John Baird Hunter, M.D. Glasg., of 3, Smithhills-street, Paisley, aged 78 years.

MCGOWAN.—On Jan. 29th, 1915, at his residence, "Hill-side," Tabankulu, Pondoland, Cape Colony, of pneumonia, W. Oscar S. McGowan, M.B., Ch.B., eldest son of Dr. William McGowan, Maghera, Co. Derry. (Cablegram).

MCKILLIAM.—On Feb. 7th, at his residence, Ballandalloch, Blackheath, Robert McKilliam, M.D.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

HOUGHTON MIFFLIN COMPANY, Boston and New York, and CONSTABLE AND CO., London.
Animal Experimentation and Medical Progress. By William Williams Keen, M.D., LL.D., with Introduction by Charles W. Eliot, LL.D. Price 7s. 6d. net.

KING, P. S., London.
The Campaign against Syphilis. By F. W. Giles, M.B. Durh., Member of the Council of the White Cross League. Price 6d.

LAURIE, T. WERNER, London.
Progressive Portugal. By Ethel C. Hargrove, F.R.G.S. Price 6s.
Manual of Training for Jungle and River Warfare. By Major Gordon Casserly, Indian Army. Price 3s. 6d. net.
The Balkan Cockpit. By W. H. Crawfurd Price. Price 10s. 6d. net.

LONG, JOHN, LIMITED, London.
Home Exercise and Health. By P. G. Masters, B.A. Cantab. Third (revised) edition, with additions. Price 2s. 6d. net.

LONGMANS, GREEN, AND CO., London.
Town Planning. By George Cadbury, jun. Price 7s. 6d. net.
Directions for a Practical Course in Chemical Physiology. By W. Cramer, Ph.D., D.Sc. Second edition. Price 3s. net.
Howe's Classified Directory to the Metropolitan Charities, 1915. Price 1s.

LIPPINCOTT, J. B., COMPANY, Philadelphia and London.
Text-book of General Therapeutics for Veterinarians. By Eugen Fröhner. Authorised translation from fourth German edition, by Louis A. Klein. Price 12s. 6d. net.

MILES, EUSTACE, Chandos-street, W.C.
Uric Acid Fetish. By Eustace Miles, M.A., and C. H. Collings. Price 1s. 6d.

NATIONAL LEAGUE FOR PHYSICAL EDUCATION, Tavistock-square, London, W.C.
Mothercraft. A course of lectures delivered under the auspices of the National Association for the Prevention of Infant Mortality at the Royal Society of Medicine and at Charing Cross Hospital Medical School. 1914. Price 3s. net.

ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH, New York.
Studies from the Rockefeller Institute for Medical Research. Vol. XIX. Reprints.

THACKER, W., AND CO., London and India.
History of the Indian Medical Service, 1600-1913. By Lieutenant-Colonel D. G. Crawford, Bengal Medical Service, retd. Two Vols. Price 28s. net.

THE PONS PRESS, Bridge-street, Manchester.
How You Live Again. By J. Mooney, M.B. Price 5s. net.

UNIVERSITY PRESS, Cambridge.
Flies in Relation to Disease: Bloodsucking Flies. By Edward Hindle, B.A., Ph.D., Assistant to the Quick Professor of Biology, Cambridge.

WHITAKER, London.
Whitaker's Almanack, 1915. By Joseph Whitaker, F.S.A. Price 2s. 6d.
Whitaker's Peerage, Baronetage, Knightage, and Companionage, 1915. Price 5s. net.

WYMAN AND SON, London, and H.M. STATIONERY OFFICES.
Manual of Instruction for the Royal Naval Sick Berth Staff. Price 2s.

Notes, Short Comments, and Answers to Correspondents.

VERMIN IN THE TRENCHES.

To the Editor of THE LANCET.

SIR,—The screeching of the shells and the ping of the rifles must be very trying to the nerves of our soldiers in the trenches, but the added filth and mud in these dwelling-places, with the forced personal uncleanliness, is a physical strain of equal sacrifice to the men; and in the midst of this abnormal state of affairs the additional irritation of the wandering louse calls forth our aid for its immediate capture. Not that this can be done readily as in ordinary civil life, still there should be no difficulty in trapping these pests swarming in their ideal quarters. If trench existence is contrary to personal cleanliness and parasitical life is engendered, there is only one remedy, and that is poison. Both large and small vermin can be only successfully destroyed in this way when they are in abundance. Therefore some easily accessible weapon of destruction should be in the possession of every soldier, and in the emergency castor-oil, on the one hand, for application to sore places, while for poisonous duties a pepper-box containing pyrethrum powder, Keating's powder, or, best of all, flowers of sulphur. Now, the latter can be dusted into the clothing, the stockings, or in any part of the underclothing. When the body gets warm the effect of the sulphurous fumes on the parasites and the ova will soon tell. Then, when an opportunity occurs, a gipsy fire is suitably extemporised, and the clothes overhanging the products of combustion—i.e., smoke—will determine the life of the vermin. I am sure this simple suggestion will comfort the external body of our noble men at the front, and they will appreciate this remedy out of fashion. May I add that sulphite of soda, 2 drachms to 1 pint of water, for bathing the body is inimical to parasitic life.

I am, Sir, yours faithfully,

Alton, Hants, Feb. 9th, 1915. JOHN FREDK. BRISCOE.

To the Editor of THE LANCET.

SIR,—We notice in your valued publication of Feb. 6th that in an article dealing with this matter Lieutenant-Colonel S. Monckton Copeman quotes some directions for using:—

Water	10 gallons.
Jeyes' fluid	1½ ounces.
Soft soap	1½ pounds.

and the lather of this compound is to be allowed to dry on the garment. In the first place, soft soap is hygroscopic and therefore unsuitable to be mixed with something that is to be allowed to dry, and in the second place, there are many more effective vermin destroyers than this particular fluid.

It seems to us that a soap like our "Cofectant" soap or our biniodide of mercury soap, being soda soaps, allowed to dry on the garment would be a much greater protection than such a compound as suggested above, and not liable to cause the garments to keep damp. "Cofectant" has been proved to kill the eggs or larvæ of vermin as well as the active units.

We are, Sir, yours faithfully,

EDWARD COOK AND CO., LIMITED.

Feb. 16th, 1915. (THOS. ALEX. COOK, Director.)

"ANCIENT LIGHTS."

To the Editor of THE LANCET.

SIR,—An interesting survival of mediæval organotherapeutics in rural England came to my notice to-day. Measles of a rather severe type is epidemic here just now, and one of my patients, a sturdy boy aged 4, who had passed through a stage of heavy rash, has had a good deal of subsequent bronchial catarrh with troublesome night cough, but with no signs of pneumonia. This morning I found him distinctly better after a night of quiet sleep, and was just about to commend the action of the last bottle of medicine when the mother, who can neither read nor write, forestalled me. "I must tell you what we done," she said; and what they done was this. A wise old woman had seen the boy on the preceding evening. His cheeks were flushed, and she pointed out that this showed that the "inflammation" had set in, and advised them to get from the butcher the lungs of a sheep just killed, to make a deep cut in each lung, and to apply them each to one of the soles of the patient's feet, keeping them attached all night by a bandage. This was religiously done, and when taken off this morning the lungs were hotter than when applied, and had "drawn out all the inflammation." The credit for the boy's recovery will, I fear, not be mine. This piece of medical lore must have been handed down by word of mouth through many generations of illiterate people.

I am, Sir, yours faithfully,

Bromsgrove, Feb. 13th, 1915. H. CAMERON KIDD.

URINE IN CHILDREN'S DISEASES.

D. G. W.—With the exception of brief articles in works on diseases of children, such as Dr. Dawson Williams's "Medical Diseases of Infancy and Childhood," most of the references to the urine in relation to children's diseases occur in text-books dealing with the general aspects of urinary analysis. There are, for example, incidental references to the urine of children in Brandeis's "L'Urine Normale et Pathologique"; Neubauer-Huppert's "Analyse des Harns," Vols. I. and II.; Abderhalden's "Handbuch der Biochemischen Arbeitsmethoden," Vol. V., Part 1; Blumenthal's "Handbuch der Speziellen Pathologie des Harns"; and Mitchell's "Modern Urinology." The first-named book deals perhaps more fully than the others with the urine of children, and it gives several useful tables showing the composition at various ages. We do not at the moment recall any articles in recent medical literature dealing specially with the examination and diagnostic value of analyses of the urine in children.

Mr. Stanley Burns (Montreal).—The details should be sent to the Imperial Cancer Research Fund, 8–11, Queen-square, London, W.C.

Enthusiast.—We are informed on the best authority that our correspondent's argument is based upon misconception.

Dr. T. D. Harries.—The criticism does not, we hope, apply to the present generation.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.

THURSDAY.—Papers:—Mr. J. F. Twort and Prof. L. Hill: The Effect of the Depth of Pulmonary Ventilation on the Oxygen in the Venous Blood of Man.—Dr. A. J. Ewart: On the Function of Chlorophyll (communicated by Prof. A. C. Seward).—Mr. E. Heron-Allen: Contributions to the Study of Bionomics and Reproductive Processes of the Foraminifera (communicated by Prof. W. A. Herdman).—Mr. A. Compton: The Influence of the Hydrogen Concentration upon the Optimum Temperature of a Ferment (communicated by Prof. W. Bulloch).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY.

SECTION OF ODONTOLOGY (Hon. Secretaries—F. Coleman, F. R. Smyth): at 8 P.M.

Short Communications:

Dr. Ackerley: (1) Some Primary Factors in the Causation of Gingivitis; (2) Disappearance of Adeno-Fibroma of Breast after adequate treatment of Oral Sepsis.

Paper:

Dr. H. Ewan Waller: The Influences of the Thyroid Gland upon Dental Caries.

SECTION OF MEDICINE.—Members of the Section of Medicine are specially invited to attend the meeting of the Section of Odontology. (See above.)

TUESDAY.

SECTION OF MEDICINE (Hon. Secretaries—John Fawcett, Charles R. Box): at 5.30 P.M.

Dr. Frederick Taylor: Case of Multiple Pulsating Tumours Secondary to Hypernephroma.

Dr. Parkes Weber: (1) Bilateral Hypernephroma with Secondary Thrombosis of the Inferior Cava and Uræmia; (2) Latent Addison's Disease revealed by the occurrence of Pneumonia

THURSDAY.

SECTION OF NEUROLOGY (Hon. Secretaries—T. Grainger Stewart, H. Campbell Thomson): at 8 P.M.

Clinical Meeting.

Demonstration of Cases.

FRIDAY.

SECTION OF EPIDEMIOLOGY AND STATE MEDICINE (Hon. Secretaries—G. S. Buchanan, William Butler): at 8.30 P.M.

Special Discussion:

The Epidemiology of Cerebro-spinal Meningitis (opened by Sir William Osler).

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY.—8.30 P.M., Adjourned X Ray Evening. Items of Interest in Connexion with the War will be demonstrated and exhibited by Dr. A. C. Jordan, Dr. H. Orton, Mr. G. Scott, Dr. S. Melville, Dr. R. Knox, and others.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.

WEDNESDAY.—8 P.M., Mr. W. J. Ashley: The Economic Position of Germany.

HUNTERIAN SOCIETY, Barbers' Hall, Monkwell-street, E.C.

WEDNESDAY.—9 P.M., Dr. T. D. Lister: Demonstration of an Apparatus for Producing Artificial Pneumothorax. Paper:—Dr. G. T. Western: Vaccine Therapy, its Present Scope.

CHILD STUDY SOCIETY LONDON, Royal Sanitary Institute, 90, Buckingham Palace-road, S.W.

THURSDAY.—6 P.M., Discussion on the Care and Development of the Child—from Ante-natal Period to Five Years of Age. Ante-natal Period, Dr. Eric Pritchard; Infancy, Miss J. Halford; One to Five Years, Dr. D. Forsyth.

HARVEIAN SOCIETY OF LONDON, Stafford Rooms, Titchborne-street, Edgware-road, W.
THURSDAY.—8.30 P.M., Paper:—Dr. E. G. Little: Rodent Ulcer, its Nature and Some Methods of Treating it.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
MONDAY, WEDNESDAY, AND FRIDAY.—5 P.M., Hunterian Lectures:—Prof. A. Keith: The Anatomy and Mechanism of the Alimentary Canal. (Illustrated by specimens from the Museum of the College and by the use of the epidiascope.) (Lectures I., II., and III.)

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—10 A.M., Dr. Simson: Diseases of Women. 10.30 A.M., Medical Registrar: Demonstration of Cases in Wards. 12 noon, Dr. Bernstein: Pathological Demonstration. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. D. Armour: Operations. Dr. Pritchard: Bacterial Therapy Department. Mr. B. Harman and Mr. Gibb: Diseases of the Eye.
TUESDAY.—10 A.M., Dr. Owen: Demonstration of Cases in Wards. 12 noon, Mr. T. Gray: Demonstration of Fractures, &c. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. 11 A.M., Mr. Souttar: Demonstration of Minor Operations. 12 noon, Lecture:—Mr. Souttar: Abdominal Diagnosis. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women. Mr. Gibb: Diseases of the Eye.
THURSDAY.—9 A.M., Dr. Bernstein: Bacterial Therapy Department. 12 noon, Lecture: Dr. G. Stewart: Neurological Cases. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. D. Armour: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 10.30 A.M., Surgical Registrar: Demonstration of Cases in Wards. 12.15 P.M., Lecture:—Dr. Bernstein: Applied Pathology. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 12 noon, Lecture:—Mr. Souttar: Surgical Anatomy of the Abdomen. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY.—Clinics:—10.30 A.M., Surgical Out-patient (Mr. B. Gillespie). 2.30 P.M., Medical Out-patient (Dr. T. R. Whipham); Gynæcological (Dr. J. B. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).
TUESDAY.—2.30 P.M., Operations. Clinics:—Medical Out-patient (Dr. A. G. Auld); Surgical (Mr. Howell Evans); Nose, Throat, and Ear (Mr. H. D. Gillies). X Rays and Electrical Methods (Dr. Metcalfe). 3.30 P.M., Medical In-patient (Dr. A. J. Whiting). 4.30 P.M., Clinical Demonstration:—Dr. A. G. Auld: Selected Medical Cases.
WEDNESDAY.—Clinics:—2 P.M., Throat Operations (Mr. Gillies). 2.30 P.M., Children's Out-patient (Dr. T. R. Whipham); Skin (Dr. G. N. Meachen); Eye (Mr. Brooks).
THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. B. Giles). Clinics:—Medical Out-patient (Dr. A. J. Whiting); Surgical (Mr. Carson); X Rays and Electrical Methods (Dr. Metcalfe)
FRIDAY.—2.30 P.M., Operations. Clinics:—Medical Out-patient (Dr. A. G. Auld); Surgical (Mr. B. Gillespie); Eye (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.
MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.
TUESDAY.—6 P.M., Dr. K. Sibley: Seborrhœa and Psoriasis.
THURSDAY.—6 P.M., Chesterfield Lecture:—Dr. M. Dockrell: Some New Growths.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.
TUESDAY.—3 P.M., Prof. C. S. Sherrington: Muscle in the Service of Nerve. (Lecture VI.)

MANCHESTER HOSPITALS POST-GRADUATE CLINICS.
THURSDAY.—ANCOATS HOSPITAL, Mill-street.—4.30 P.M., Dr. Bythell: Military Radiography.

For further particulars of the above Lectures, &c., see Advertisement Pages.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

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THE INDEX TO THE LANCET.

THE Index and Title-page to Vol. II. of 1914 were given in THE LANCET of Dec. 26th, 1914.

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(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Feb. 17th, 1915.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Feb. 11	29·61	S.E.	...	79	47	37	37	38	Foggy
,, 12	29 41	N.E.	...	50	41	35	35	36	Foggy
,, 13	29 01	S.E.	0·19	48	48	34	38	39	Raining
,, 14	28·78	W.	0·21	65	42	39	37	39	Raining
,, 15	29·60	N.W.	...	63	45	36	34	36	Fine
,, 16	30·13	S.W.	0·19	67	46	33	33	33	Foggy
,, 17	29·62	S.W.	...	49	48	33	43	44	Raining

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